

FEBRUARY 1920 ~ No 169

Monthly

A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A. H. HITCHCOCK
1220-1235 Caxton Building
Chicago

TO CHANGE
THE SPEED TURN
THE HAND WHEEL

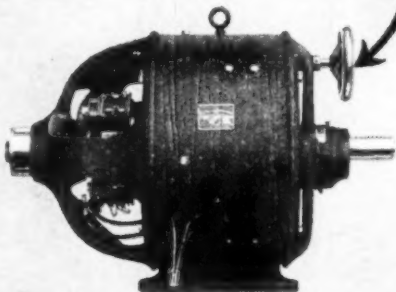


For your machine tools you need an easy way of changing cutting speeds to suit all sizes and kinds of material. The simplest and surest way of getting just the speeds you want is by applying Type AS Reliance Motors. They run at any speed with a constant horsepower output over any range up to 1 to 10. *For details get Bulletin 1014.*

Reliance Electric & Engineering Co.

1050 Ivanhoe Road, Cleveland, Ohio

BRANCHES: Boston, New York, Philadelphia, Pittsburgh, Chicago



Type **AS** Adjustable Speed
RELIANCE MOTORS

TO CHANGE
THE SPEED TURN
THE HAND WHEEL

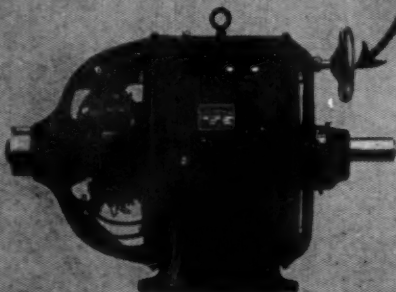


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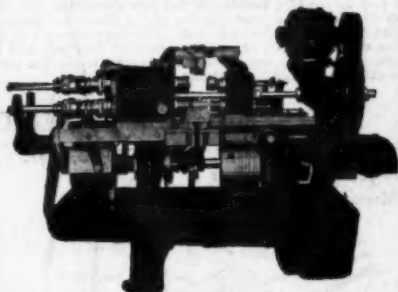
ACME AUTOMATICS

THE MULTIPLES DESIGNED FOR SERVICE

Perhaps, it's a question of speedier production in duplicate part manufacture.

If so, it's time for you to add your name to the long list of satisfied Acme users.

*Capacities up to 3 $\frac{3}{4}$ " diam.
Belt or Motor Driven.*



THE NATIONAL ACME CO. CLEVELAND, OHIO

New England Plant, Windsor, Vt. Canadian Screw Plant, Montreal, P. Q.

Branch Offices:

NEW YORK BOSTON CHICAGO BUFFALO DETROIT

WAREHOUSES—NEW YORK AND CHICAGO

WESTERN, SOUTHERN AND FOREIGN REPRESENTATIVES

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies and Screw Machine Products at Cleveland, Ohio

A CHALLENGE

An Illustrated Advertisement frequently appears which reads thus—"We guarantee this tool to take a heavier cut than any Boring Tool made." Invited thus, we challenge the advertiser to submit one of these tools to be tested out, against one of our Single Reversible Boring Tools, by some Technical College of known reputation. The said College to be instructed to proceed from the practical standpoint of one who owns a lathe of popular size and proportions, and wants a Boring Tool for the heaviest possible duty, and has nothing except the literature of the two competing Companies to govern his action. Furthermore, the said college is to hold no personal interviews with either side of this contest or have any closed correspondence with either.

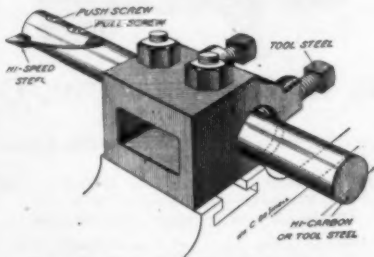
The cost of the test to be borne by the loser.

We believe that our cheap Cast Iron, One-piece, Double King-bolted, Single Reversible Holder is equal to the said advertised tool in rigidity; besides, it has two elevations, five Bars, heavy Mac-it Screws, and the size of the Bar is not limited by the size of the slot in the tool post. The Bars also are of high carbon steel, in which the cutter, clamped by Push and Pull screws, sits entirely below its axial center, while the cutting point extends beyond its front end.

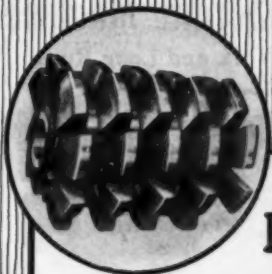
RIGID TOOL HOLDER CO.

By E. F. GIBBS, Mgr.

Washington, D. C., January 8, 1920



Single Reversible Boring Tool



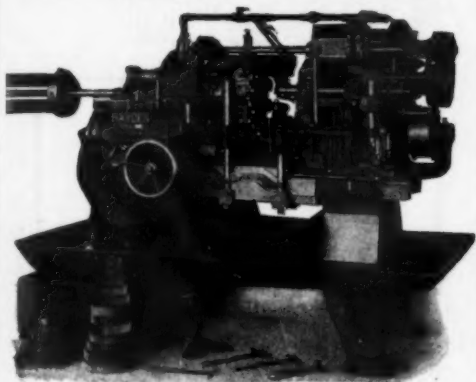
Hobs

Prompt deliveries are being offered on Brown & Sharpe Hobs for Worm Wheels, Spur Gears or special purposes.

This offer is being taken advantage of by manufacturers with an eye to the future. Check up your Hob and Cutter equipment—be ready for all orders that require accuracy and speed, the winning combination that has made our cutters the favorite.

BROWN & SHARPE MFG. CO.
PROVIDENCE, R. I.

The Most Universal
Automatic Screw Machine
For Jobbing Work and Long Runs



The Cincinnati 5-Spindle Automatic Screw Machine

The wide range of work it will perform complete and the ease with which it is set up for a new job, make it particularly valuable for jobbing work.

The speed with which it turns out work—one piece every $2\frac{1}{2}$ to 36 seconds—makes it economical on long runs.

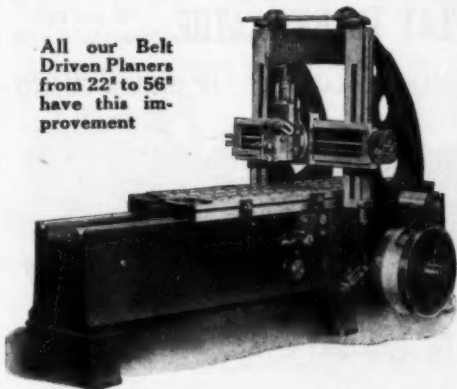
Its 48 *Superior Features*, which are fully described in the Catalog, add materially to its productiveness, economy, convenience and general usefulness.

You'll find the Catalog convincing; may we send it?

Cincinnati Automatic Machine Co.
Oakley, Cincinnati, Ohio

The Cincinnati Patent Tu-Speed Drive

All our Belt
Driven Planers
from 22" to 56"
have this im-
provement



The great advantage of being able to use either one of two speeds on a planer at the touch of the hand is so obvious to the practical mechanic that it doesn't admit of argument.

On all Cincinnati Belt Driven Planers from 22" to 56" the operator can change the speed from fast to slow, or slow to fast, by simply shifting a lever within easy reach without even stopping the machine.

Variable speeds, rapid operation and great rigidity combine to put Cincinnati Planers in the lead as large producers and great economizers.

*Put us to the proof, without obligation
What will be your planer needs for the year?*

The Cincinnati Planer Co.

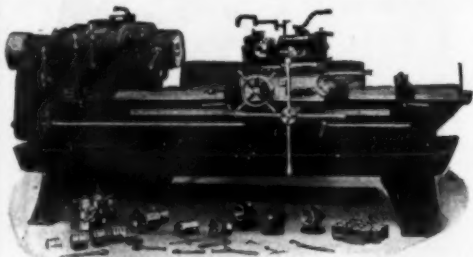
Cincinnati, Ohio, U. S. A.

CINCINNATI-ACME

**3/4 x 36 - INCH
COMBINATION**

FLAT TURRET LATHE **THE MOST RIGID
TURRET LATHE MADE**

3/4"x36" BAR CAPACITY 16" CHUCKING CAPACITY



3/4"x36" Cincinnati-Acme equipped for bar work

If you turn out quantities of detail parts which come within the range of this machine, the chances are nine out of ten that it will greatly increase your production at a big saving in cost. If in doubt whether it is adapted to your work, the cost and trouble of submitting your problem to us is only trifling, and if the Cincinnati-Acme meets your requirements you will be glad you looked into it. It is making in many a shop some production records which you will be glad to have duplicated in your own.

If it's worth while at all, why not write today?

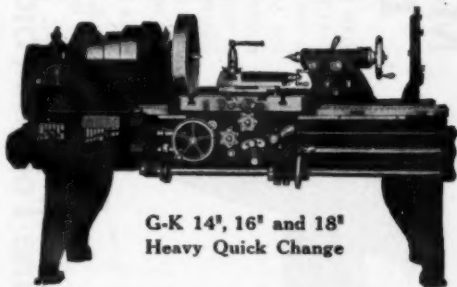
THE ACME MACHINE TOOL CO.

CINCINNATI, OHIO, U. S. A.

GREAVES - KLUSMAN
GENEROUS - CUTTING

14" To 30" Engine Lathes

**Heavy Quick Change Type and
Geared Head Single Lever Control Type**



**G-K 14", 16" and 18"
Heavy Quick Change**

G-K ENGINE LATHES meet every requirement of tool room and shop in a way that delights the user.

Our long, practical experience has enabled us to add to the average run of high-grade lathes a series of valuable "betterments", which many of our customers declare have placed G-K Lathes in a class by themselves.

*Write for the book, called "G-K Betterments,"
describing the improvements in G-K Lathes*

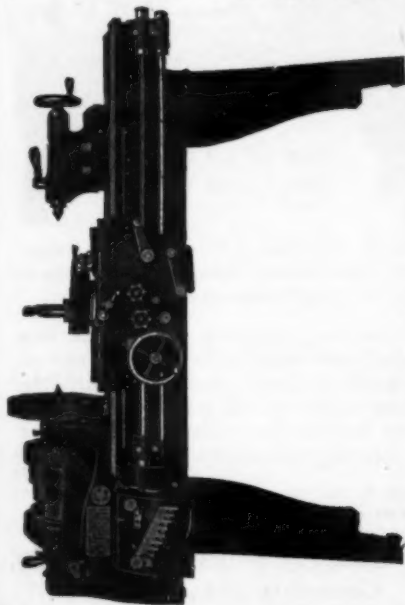
The Greaves-Klusman Tool Co.
Cincinnati, Ohio, U. S. A.

Monarch Lathes

give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes.** Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

Sold by a leading Machinery Dealer in every machinery center.



The Monarch Machine Tool Co., Sidney, Ohio

Joseph T. Ryerson & Son Chicago, Illinois

— and the —

Conradson Machine Tool Co. Green Bay, Wis.

take pleasure in announcing an association of interest in the manufacture and sale of the new line of "RYERSON-CONRADSON" Machine Tools.

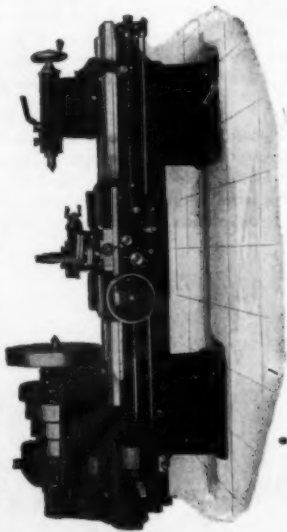
Mr. C. M. Conradson, President of the Conradson Machine Tool Co. and of national reputation, is the inventor and designer of the line of Plain and Universal Milling Machines, Selective Head Lathes, Planers and Radial Drills.

Joseph T. Ryerson & Son are enlarging their machinery organization which now includes plants in Chicago, St. Louis, Detroit, Buffalo and New York, offices in the larger American cities, and agents and direct representatives throughout the world.



Home of the "Ryerson-Conradson Machine Tools"

SIDNEY LATHES — For All Requirements



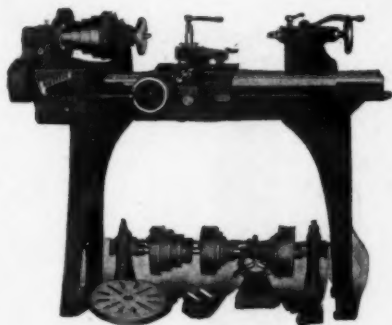
The Sidney Line of medium and heavy duty lathes includes a lathe for every class of work, regardless of the size or type of shop you are running.

Lathes of medium duty in 14, 16, 18 and 20-inch swings, and of heavy duty in 15, 17, 19, 25, 27, 30 and 36-inch swings.

Send for Bulletin No. 45.

THE SIDNEY MACHINE TOOL CO., Sidney, Ohio

THE NEW
WORCESTER
Quick Change Lathe



12" and 14" Swing

This Lathe is of the same high grade construction as is typical of all Worcester Lathes, and its accuracy and reliability, together with the small floor space which it requires, make it a very efficient and desirable lathe for tool room work.

Complete description furnished on request

Worcester Lathe Company
100 Beacon Street, Worcester, Mass.

Carroll-Jamieson Quick Change Gear 14" Lathe With Single Or Double Back Gear



Actual Swing, 15 $\frac{1}{4}$ "

**Has 32 Changes of Feed
without removing a gear**

This lathe is noted for its convenience, durability, accuracy and simplicity.

It cuts all standard and odd threads from 3 to 64 per inch, including 11 $\frac{1}{2}$ " pipe threads, right or left hand—and one handle or knob effects all necessary adjustments.

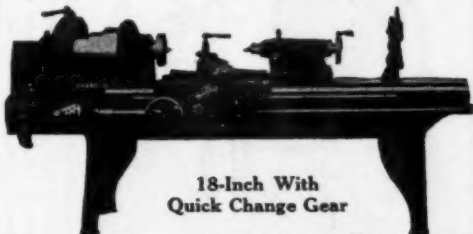
Thread indicator, taper attachment and turret attachment can be furnished at extra cost. All tools are fully guaranteed and tested out to the highest point for accuracy.

*And the price is moderate
Write for full details*

THE CARROLL-JAMIESON MACHINE TOOL CO., Batavia, Ohio

The "Chard"

Of Practical Super-Quality



18-Inch With
Quick Change Gear

Made in sizes 16", 18", 20", 24" and 28"

The super-quality of the "Chard" does not lie in a lot of gimcracks, but in its ability to stand the gaff and to do things. It is probably the heaviest lathe made, either part by part or taken as a whole. It has a practical mechanical excellence that means heavy cuts, stiffness, accuracy, convenience, flexibility. It bores holes through bronze without tolerance of any kind. It does heavy work with ease, accuracy and dispatch. It has a super-quality of working ability that makes it a profitable investment.

May we describe the sizes in which you are interested?

Chard Lathe Company
Newcastle, Ind.

DISTRIBUTORS

THE F. O. STALLMAN SUPPLY CO., San Francisco, Cal.
VONNEGUT MACHINERY CO., Indianapolis, Ind.
ENGLISH & MILLER MACHINERY CO., Detroit, Mich.
J. S. MILLER MACHINERY CO., Pittsburgh, Pa.
MONARCH MACHINERY CO., Philadelphia, Pa.
THE BIGGS-WATTERSON CO., Cleveland and Dayton, Ohio.
McMULLEN MACHINERY CO., Grand Rapids, Mich.
SAXER MACHINERY CO., Erie, Pa.
MANNING, MAXWELL & MOORE, New York, Chicago,
Boston, Mass., Cincinnati, O., Buffalo, N. Y., Rochester, N. Y.,
Milwaukee, Wis., St. Louis, Mo., Seattle, Wash.
ALFRED HERBERT, Brussels, Belgium.

Pat. Jan. 30, 1917



Automatic Extension Reel

For electric lamps; also for electric portable drills, grinders, etc. Light just where wanted. Automatically rewinds, and locks at any point. 25 ft. cord. Approved by Underwriters.

The Cincinnati Specialty Mfg. Co., Inc.
1913-21 Powers St., Cincinnati, Ohio
Branch Offices: East Pike St. & Boylston Ave.,
Seattle, Washington; 39-41 Cortlandt St., New York

"VINGO" HIGH SPEED STEEL

for LATHE, PLANER, and SHAPER TOOLS

'Vingo' is the latest arrival from the renowned Sheffield steel district and its pedigree is backed by the expert craftsmanship of the hundred-year-old Sheffield Steel makers, Moss, Eadon & Sons, Ltd.

The necessary hammering to densify this steel is done at the works, so the user does not have to resort to forging to get results.

Carried in stock in all the popular sizes.

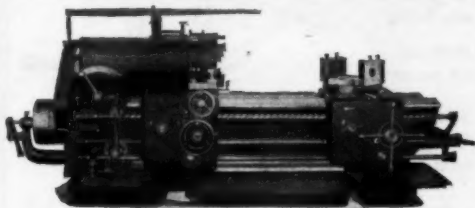
ALFRED HERBERT, Ltd.,
54 Dey Street, New York

11

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



Steinle 24" Full Swing Side Carriage Turret Lathe

Machine is regularly furnished belt driven or arranged for motor drive.

Actual swing over ways	24"
Swing over side carriage	21"
Diameter of hole through spindle.....	4" or 6 1/4"
Traverse of side carriage and of turret carriage	56"

Both carriages have independent quick change feed and independent power traverse all controlled from carriage aprons.

Side carriage can be run past the chuck and is equipped with cross slide having power cross feed and with turret tool block having four tool holders.

There are thirty reversible spindle speeds available. One belt or one motor furnishes power for all functions of the machine.

Turret is massive and designed particularly with a view to rigid support of tool equipment.

Send us drawings of fly wheels, pistons, piston rings, gear blanks of all descriptions, hubs, and other similar parts so that we may give you production estimates and recommendations covering prices and nature of tooling equipment for their rapid, accurate, and economical production.

Numerous repeat orders received from many of the principal manufacturers of tractors, trucks, aviation motors, marine gas engines, and stationary engines demonstrate the satisfactory results obtained from the use of our machines.

Newman 5-Hole Tailstock Turret

An Accurate, Substantial, Economical Tool

Makes any lathe a turret lathe. A big pump concern writes: "Within a year this tool has paid for itself several times."

Will fit
any lathe

Attaches in
15 seconds

Sent on
10 days'
trial



Prove its merit yourself. You have much to gain—nothing to lose

NEWMAN MANUFACTURING CO., Cincinnati, O.

The "Towsley" Improved Straightener

Will True Up All Bends In Bar Stock

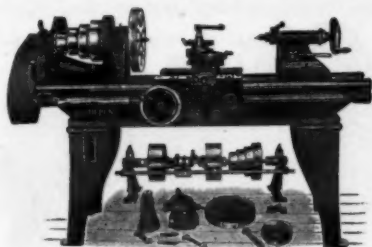
Quicker, easier, cheaper and more accurate than hammering or lathe centering. Straightens shafts, arbors, axles, etc., bent in handling or hammering.



Especially designed for centering and straightening work in the rough and pieces accidentally sprung in use; or for reamers, etc., which have been sprung in tempering. A one-man machine—capacity 48"x2½". *Better look into it.*

JOHN T. TOWSLEY MFG. CO., 1037 Woodrow St., CINCINNATI, OHIO

South Bend Lathe



Made with straight or gap bed.
Price includes equipment as shown in illustration

For the Machine and Repair Shops

13" Lathe.....	\$385.00	18" Lathe.....	\$ 735.00
15" Lathe.....	483.00	21" Lathe.....	900.00
16" Lathe.....	550.00	24" Lathe.....	1250.00

With Beds from 4 ft. to 16 ft. in length.

South Bend Lathes have been on the
market 14 years. Over 22,000 in use.

New York Office: - 2½ Murray Street
Boston Office: - - 65 Oliver Street
Philadelphia Office: - 33 N. Seventh St.

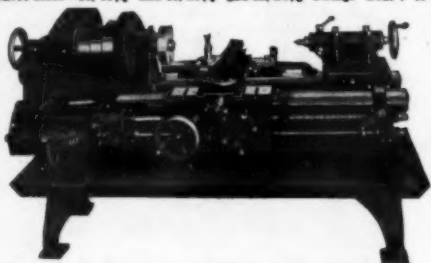
Free catalogue mailed on request

South Bend Lathe Works

Established 1906 South Bend, Ind. 430 E. Madison

"LEHMANN LATHES"

Three Sizes—16/18 $\frac{1}{4}$ " and 18/20 $\frac{1}{4}$ " and 22/24 $\frac{3}{8}$ " Swing. Beds 7' to 17'



These are strictly high-grade engine lathes of superior design and thoroughly good workmanship and material. Built for accuracy and production.

Write for complete specifications and details. Do it today—NOW.

LEHMANN MACHINE CO., 608 S. Broadway, ST. LOUIS, U.S.A.



It's Portable

The BARR Pneumatic Hammer

Is used by the best people in the world!

U. S. Navy—Many Large Ship Builders—
American and Foreign Railways and Min-
ing Companies—Automobile, Truck and
Motor Mfrs.—Big Electrical Mfrs.—Or-
namental Iron Works, Etc.

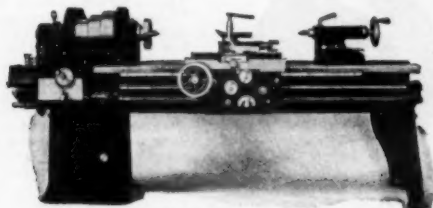
It is conceded one of the most profitably
adaptable tools ever placed in shop or
tool room! Equally useful in the field.

*If you do not know this excellent time saver,
write today for Bulletin 10H.*



Distinctive Advantages

Are Embodied in the 18-inch B. & E.
Instantaneous Change Gear Engine Lathe



You will agree with us that to have instantly available any pitch or feed shown in the accompanying index, helps to expedite the work and augments shop economy.

Front Index Handle in Hole						1	2	3	4	5	6	7	8
Top Index Handle in Hole,	1	Cuts Threads per in.	2	2½	2½	2½	3	3½	3½	3½	4	4½	4½
“ “ “ “ “	2	“ “ “ “	4	4½	5	5½	5½	6	6½	6½	7	7½	7½
“ “ “ “ “	3	“ “ “ “	8	9	10	11	11½	12	13	14	15	16	17
“ “ “ “ “	4	“ “ “ “	16	18	20	22	23	24	26	28	30	32	34
“ “ “ “ “	5	“ “ “ “	32	36	40	44	46	48	52	56	60	64	68

Feeds 4 Times Threads per Inch W. T. Emmes pat., Aug. 26, 1902, Oct. 28, 1902

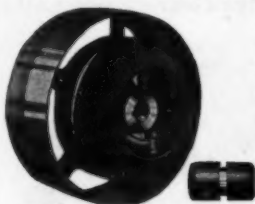
This Lathe embodies the usual B. & E. care of details, including design, workmanship and materials. It's a high grade machine tool that's built to give top-notch service in both tool room and shop. We should like to send you full particulars about the distinctive features which give users decided advantages.

*And the price is not the sort to make
you hesitate to sign on the dotted line*

The Boye & Emmes Machine Tool Co.

2245-2251 Spring Grove Ave., Cincinnati, Ohio

"Edgemonts" Stand Hardest Usage And With No Danger of Breaking



Enclosed Type, Self-Oiling

A Friction Clutch for Every Purpose—

That's what you will find in the "Edgemont" family. Our many diverse types are giving satisfaction to thousands of leading manufacturers.

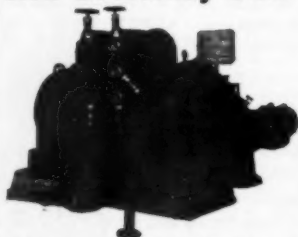
Long, hard usage under every conceivable condition of service, has proven them *good clutches*. They are so powerful that they never slip—we guarantee them to pull all that a belt will at any speed. Would you like to know more? Then—

Write for Catalog of "The Clutch that's stood the test"

The Edgemont Machine Co. **Dayton, Ohio**

Special Clutches and Transmission Machinery for all purposes.

Lea-Courtenay Fire Pump Unit



(WITH MOTOR DRIVE)

Lea-Courtenay standard Underwriters Fire Pump delivering 1500 G. P. M. at 100 pounds pressure, running at 1750 R.P.M. Built according to the National Board specifications and approved by all fire underwriters.

Adequate protection for the isolated plant or as a stand-by for emergency where electric as well as steam power is available. Always ready for instant service. Develops rated pressure with start of pump and maintains it constantly in operation. No expense when not in service. This type of fire pump carried in stock in various sizes for immediate shipment.

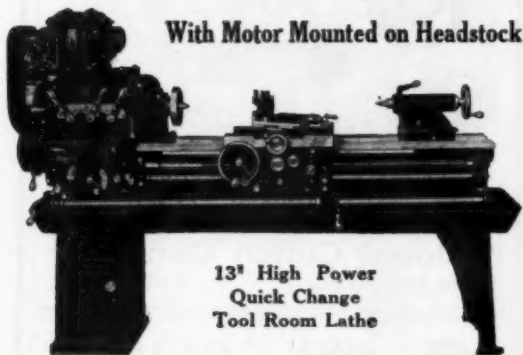
Every pump tested under actual operating conditions before shipping.

LEA-COURTENAY COMPANY, 10 Maine St., NEWARK, N. J.

MAKERS OF CENTRIFUGAL PUMPING MACHINERY

The WILLARD MATTMAN BRATTEN All-Geared-Head Lathe

With Motor Mounted on Headstock



13' High Power
Quick Change
Tool Room Lathe

The Headstock of our All-Geared-Head Tool Room Lathe is a full box section, internally ribbed and fully self-contained, with selective speed changes inside the headstock. It is impossible to throw in two different speeds at one time. There are six different speeds available when clutch is thrown in and six more through the back gears—12 in all. All gears are chrome nickel steel and all sliding gears are hardened.

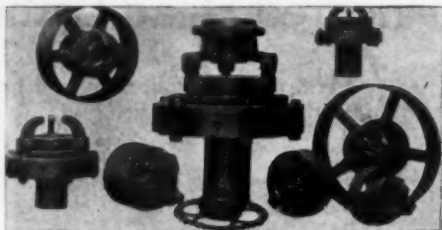
The Spindle is chrome nickel steel, forged and bored from the solid, ground to accurate size and guaranteed interchangeable, with phosphor bronze bearings.

The entire construction is consistently high grade, with great power, accuracy and convenience insuring an output that is unusual in quality and quantity.

Write for description of Willard Tool Room or Engine Lathes, either All-Geared-Head or Cone Type.

The Willard Machine Tool Co., Inc.
F Street, Box 784 CINCINNATI, O., U. S. A.

**Refer your clutch problems to us
Solving them is our business**



*Special Clutches — a specialty
Catalogue cheerfully sent on request.*

National Clutch Company
1859 Fulton St., Chicago, Ill.



CONWAY

CLAMP COMPRESSION

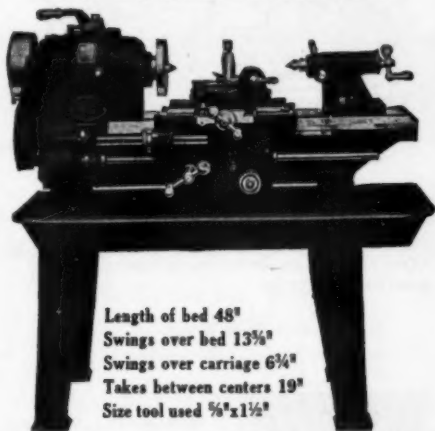
CLUTCH

THE FEATURE of this Clamp Clutch is a semi-split carrier. The carrier is sawed half-way through, and at right angles to it there is a bolt which clamps the clutch to the shaft with sufficient binding force to drive the clutch with its load. This is a favorite type with many users, as it requires no set screw nor keyseat. As a guard against overload and small shafts, however, a key may be used.

Send for Catalog which fully describes our many Clutches

CONWAY & COMPANY, STOCK YARDS P. O. CINCINNATI, O.

Effect a Real Short Cut in Time
With Adams Short Cut Lathe
In Quantity Production of Short Parts



Length of bed 48"
Swings over bed 13½"
Swings over carriage 6¾"
Takes between centers 19"
Size tool used ⅝"x1½"

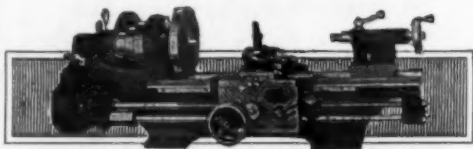
ADAMS SHORT CUT LATHE is a specialized machine for rapid production of duplicate parts of short length and comparatively small diameters. While simplicity of design predominates, the Adams is equipped for flexibility, ease of operation and maximum production. It occupies only 4' 6"x2' 4" floor space.

The work within its range is done more easily, more quickly and at less cost by the Adams than by larger lathes. It is capable, however, of taking as heavy cuts as its 16" and 18" competitors.

*Economical and high-grade throughout.
How about getting our Catalog?*

O. R. Adams Manufacturing Co., Inc.
Rochester, N. Y.

"ADVANCING"



TYPE B-6 LATHES will be ready for delivery December 1st 1919. Ask about them.

During the past few years we have heard the word "RETREATING" so many times used, that when the cables or wireless flashed the word "ADVANCING" we all felt there was something good in store for us.

Yes ?



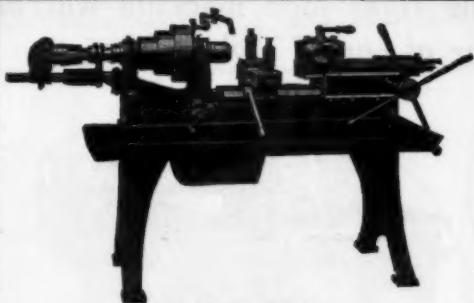
This Photograph shows
HUBERT DALTON PECK
"ADVANCING"

with a shovel removing the
first earth for the new and
permanent home of the

"DALTON SIX" Type B-4
and
"DALTON SIX" Type B-6
LATHES.

at Sound Beach, Connecticut,
U.S.A.

DALTON MANUFACTURING CORP. New York City U.S.A.
After February 1st 1920, Sound Beach, Connecticut, U.S.A.



MODEL "D"

Turret Lathes and Screw Machines

Now Ready for Delivery

**Designed for Rapid Manufacturing of
Parts Requiring Several Operations**

MADE IN FOUR SIZES:

- No. 2 { $1\frac{1}{8}$ " Wire Feed Capacity, Plain Head
 { $1\frac{3}{8}$ " Hole Through Spindle.
- No. 3 { $1\frac{1}{2}$ " Wire Feed Capacity, Plain Head
 { $1\frac{3}{4}$ " Hole Through Spindle.
- No. 4 { $1\frac{3}{4}$ " Wire Feed Capacity, Geared Head
 { $2\frac{1}{8}$ " Hole Through Spindle.
- No. 5 { $1\frac{7}{8}$ " Wire Feed Capacity, Geared Head
 { $2\frac{3}{8}$ " Hole Through Spindle.

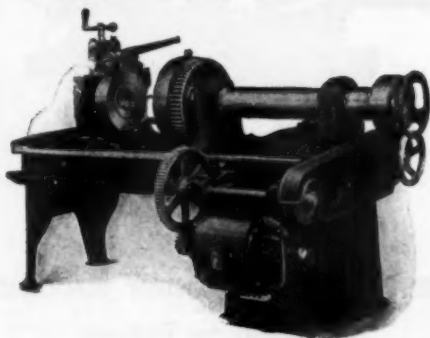
**With or Without Power Feed to Turret Slide.
Mechanically Perfect and Fully Guaranteed.**

Manufactured By

Smurr & Kamen Company

328-330 N. Albany Ave., Chicago, Ill.

The *right* pipe machine will be one of our 17 styles and sizes



(No. 3 Peerless. All Gears are Covered)

EVERY B. & K. Pipe Threading Machine is built to give top-notch service—maximum production, accurate work, with costs down to the minimum. We have been specializing for many years on this kind of machine, and our long experience and record of success gives us every confidence that we can equip you *right*.

All B. & Ks. are equipped with a gear box drive for obtaining the proper threading speeds. This eliminates all uncertainty or guess work in selecting the right speed for threading each size of pipe. A rotary oil pump supplies oil to both the dies and cutting-off tool. Dies can be changed without removing a screw. And there are other advantages.

*For the complete story read our Catalog
B. & Ks. thread pipe from $\frac{1}{4}$ to 18 in. diameter*

Bignall & Keeler Machine Works
Edwardsville, Illinois

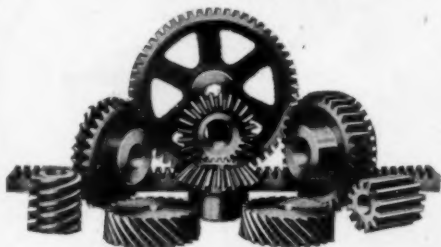
THE TILTED TURRET

A CLEAR TRACK THE STOCK



Standardized Boston Gears

1200 Sizes



Immediate Delivery

From CHICAGO BRANCH
and from the FACTORY

Agents With Large Stocks in the Leading Cities

Send for 1920 Catalog

Boston Gear Works

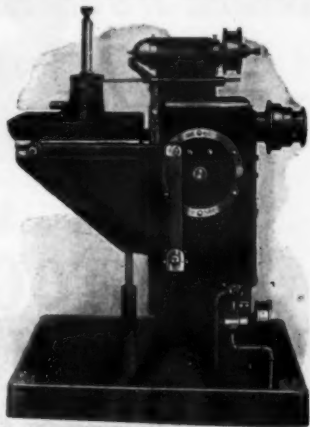
Branch and Salesroom

623-625 W. Washington Blvd., CHICAGO, ILL.

Main Office and Factory

Norfolk Downs - - QUINCY, MASS.

*It rounds the teeth of sliding mesh gears
at a great deal less cost and much better*



The Cross Gear Tooth Rounder

Output and economy: Absolutely guaranteed to round 24 teeth a minute, any pitch $\frac{5}{8}$ or finer—by far the most economical method.

Quality of work: Every tooth is a perfect half circle from tip to root—the only really perfect shape for sliding mesh gears.

Tank and tractor gears properly rounded on a production basis, and the "Cross" is the only machine which accomplishes such a result.

Yes, it's revolutionary; but we are ready to prove up

Cross Gear & Engine Company

Detroit, Michigan

Patented here and abroad; sold ONLY by us



Branch Office Service on

STOCK BUSHINGS



*This is the type
of Bushing which
can be supplied
from stock*

We recently announced our readiness to supply a wide variety of sizes of straight-dimension, finished, bronze bushings from *stock*,—giving you the benefit even on small orders, of the economies of volume production.

The immediate and emphatic success of this service has led us to broaden its scope by carrying both Stock Bushings and Cored Bars in our branch offices, as well as at the main plant.

*Address the nearest office
and ask for Stock List "W"*

The Bunting Brass & Bronze Co.

755 Spencer St., Toledo, Ohio

CLEVELAND: 1362 E. 6th Street.

CHICAGO: Room 312 Madison Terminal
Building, 9 S. Clinton St.

NEW YORK: Grand Central Palace, Care
International Factory Appliance Exposition.

Well-known machine changes name

*"Nivin Metal Parts Washing Machine"
now known as the "Crescent"*

To identify this efficient metal parts washer more closely with the company that manufactures it, on December 1st the "Nivin" took the name of its makers, the Crescent Washing Machine Company.



The Crescent Washing Machine Company is the *original* and parent company under which the Nivin Mfg. Co. has operated. There will be no change in the machine. The factory, the personnel and the policy of the company are in no way affected. The parent organization remains intact, and the manufacture of the same high-standard metal parts washer will continue as before.

Nivin efficiency has increased production and lowered costs in hundreds of metal working plants. Our literature will gladly be sent without obligation.

CRESCENT WASHING MACHINE COMPANY

(The original Nivin Mfg. Co.)

843 Larrabee Street
CHICAGO

For Hard, Continuous Service

Willard Power Presses

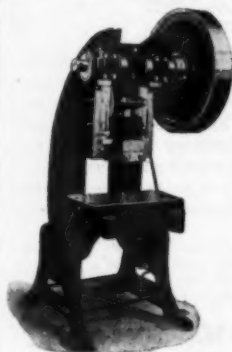
With Inclinable Open Back

These presses are designed for hard, continuous service along lines dictated by long experience in the use of this class of machinery. "Willards" combine in construction features of originality and up-to-date practical improvements. They are heavy, powerful, accurate and durable. They do a great variety of work, including all kinds of blank cutting, forming, perforating, punching, drawing, shaping and combination die work.



Drop us a card—we'll send technical details and give you a better idea of what they do

The Willard Press & Tool Co.
Cincinnati, Ohio



L.-J. Inclinable Power Presses

For the Coming Year

Will mean maximum output, economy and satisfaction. They have every modern convenience necessary for accurate and rapid production; and their rigidity insures long-continued, unrelenting service.

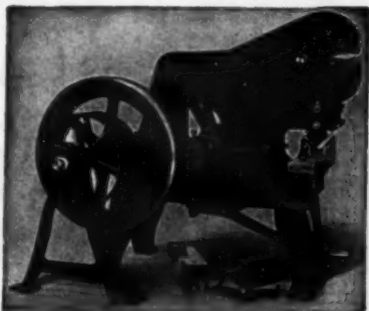
Our Dealers

Stocker-Kumely-Wachs Co., Chicago
W. J. Hain Machinery Co., Detroit
Herberts Machinery & Supply Co.,
Los Angeles and San Francisco, Cal.
J. L. Lucas & Son Inc., Bridgeport, Conn.
Brown-McDonald Mch. Co., St. Louis
Northern Machinery Co., Minneapolis
Clark Machinery Co., Cleveland, Ohio
Patterson Tool & Sup'y Co., Dayton, O.
Dale-Brewster Mch. Co., New York
Swind Machinery Co., Philadelphia, Pa.

Write to the nearest, or

Loshbough-Jordan Tool & Mche. Co.
Elkhart, Indiana

Punches—Shears—Bending Rolls
The Beloit
Combined Power Punch And Shear



Built in six sizes. Nos. 51, 52, 53, 54, 55 and 56

Direct connected motor or belt drive

This is the best all around punch and shear in a combined machine of moderate cost. It is heavy and substantial, and amply back geared to require the minimum amount of power; is strong, compact, and easy to operate. Can be equipped with angle shearing attachment, architectural jaw, or for special work.

We are putting out a complete line of punching and shearing machinery in both power and hand tools, also light and heavy duty bending rolls.

We do not overrate the capacities of our machines.

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

Peter Bros. Abrasive Metal Cutter Does More Work In Less Time

It will cut a square bar up to $\frac{3}{4}$ " in less than one-fourth the time required to nick and break it, and saves loss and waste of stock that the latter method entails. This cutter has no equal for cutting high-speed and other hardening steels. It reduces cutting costs 75%.

8" Size \$22.50, with C. S.
Splendid for tool room. Cuts high-speed steel up to $\frac{1}{4}$ " square.

12" Size \$60, with C. S.
Cuts up to $2\frac{1}{2}$ " diameter, round or square, at any angle up to 45 degrees. Ball bearing.

15 Days' Free Trial

Write us or ask your dealer

PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.



The Gray Sheet Metal Cutter— Here's a Sample of Its Work



IT'S NOT a rotary shear. The illustration shows but one example of the work of the "Gray". By an entirely new method, it cuts sheets and plates into any conceivable shapes, doing work on which you might employ a shear of any description, as well as an unlimited scope of work for which a shear would be useless. No springing or buckling.

Let us post you on this distinctive metal cutter

W. J. SAVAGE CO., Knoxville, Tenn.

Peerless **HIGH SPEED**

The Standard Metal Saw of Today



The "Peerless" is some hundred pounds heavier than other machines of its capacity, making it more rigid and accurate—saves both expensive stock and repairs.

The balanced lift, automatic feed, straight line pull, positive blade clamp and general rigidity reduce blade breakage to a minimum. This saves both blades and time.

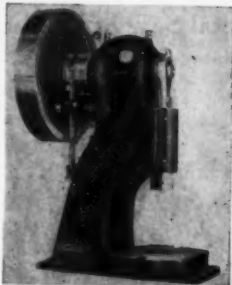
The pressure of blade remains constant at any angle, but is under easy lever control. This, with the balanced lift, straight line pull, etc., insures the fastest cutting of which the blade is capable.

Furnished with or without our Six-Speed Gear Box, also with motor drive if desired.

Write for complete description and our 30-DAY TRIAL OFFER

Peerless Machine Company
1606 Racine Street, RACINE, WISCONSIN

Emco Bench Press



Weight, lbs.,....130

Stroke,.... $\frac{3}{4}$ " or $1\frac{1}{4}$ "

Capacity,-- $\frac{3}{4}$ "x1-16"

For rapid production on
Small Parts

Used in quantities by many
large operators.

Specials—Iron Stand, Die
Block, Inclining Blocks, Mo-
tor, Counter.

Absolute non-repeat stop
on one stroke.

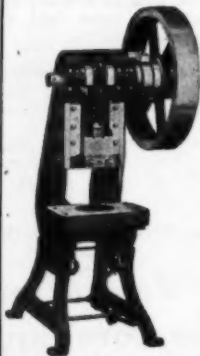
Made absolutely accurate for
die and other fine work.

EMCO "W" Bench Pwr. Punch Press

Write for circular

The Enterprise Machinery Co., 28 S. Clinton St.
CHICAGO, ILL.

Here Is A Press



With Plenty of Steam
Back of THE PUNCH

HIGH DUTY
ROCKFORD
PUNCH PRESSES

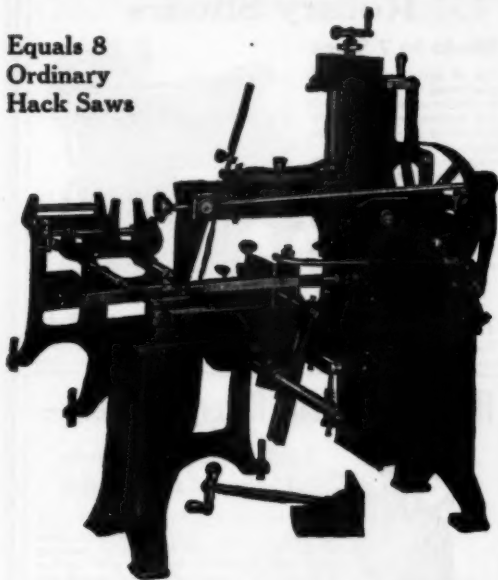
Made in straight side and
inclinable types. Their great
power backed by rigid design
enable them to do the work
you demand and stand up to it.

Write For Catalog

Rockford Iron Works
Rockford, Ill.

Automatic Stock Feed, Draw Cut
Marvel No. 5 High Speed Saw

**Equals 8
Ordinary
Hack Saws**



Cuts up the bar into duplicate pieces to the length desired automatically without attention of operator. The most complete combination of speed, economy and accuracy ever made. In tests made at extreme feed pressure at 145 r. p. m. it cut 5" round cold steel in 8 minutes and 6" in 10 minutes. Furnished motor driven if desired.

A "Marvel" in name and in fact. Shall we mail full description?

Armstrong-Blum Mfg. Co.
341 N. Francisco Ave., Chicago, Illinois

"QUICKWORK"

Registered in U.S.A. and Foreign Countries

Rotary Shears

Made in 7 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

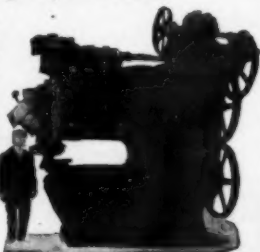
Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

Write for catalogue No. 60

Patented June 3rd, 1913

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.
Cable Address "Quickwork," "W. U." and "General" Codes



Here's the Grant Rotary Riveter—



**It rolls or swedges rivet shanks
and leaves rivet surfaces perfect**

THIS NOISELESS, BLOWLESS rivet spinner saves your nerves as well as your work. The "Grant" method of riveting produces absolutely uniform work and a quantity 500% greater than that turned out by old-fashioned methods.

Perfectly formed, highly-polished rivets, free from hammer or tool marks, are the result of using the "Grant." It will place rivets in the hardest-to-get-at places, and its speed is limited only by the ability of the operator to feed it.

*Send for Catalog, or send us a
sample of your work, or both*

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

George A. Lewthwaite

**Time
Tested**

Punches and Dies



For
**Iron Workers
Ship Builders
Boiler Makers
Metal Lathers
Metal Bed Mfrs.
Sheet Iron Workers
Etc., Etc.**

Try them out—that's all

Lewthwaite Shear and Rod Cutter

This
ient and
find it just
your shop, for it
easily shearing and
beyond its rated capacity.
earn its cost in a compara-
tively short time.

handy tool is compact, conven-
easy to operate. You will
right for many jobs in
has power to do
cutting even
It will



Also

**Pipe Benders
Bar Benders
Power Presses
Foot Presses
Etc., Etc.**

Get our Catalog of Iron-Workers' Tools for handy reference

George A. Lewthwaite Co.

116 Walker St., - - New York



We Sell Service

For punch service, T. H. L.'s can't be beat. We have always made good punches. And now after almost 30 years of specializing in the manufacture of punches and dies, we are able to make punches which are unexcelled for their service and dependability.

T. H. L. Punches

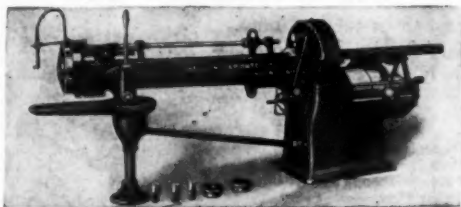
are accurate and uniformly made of the correct steel for maximum results. They are a rugged help to the speeding up of production and the cutting down of wasted time.



Why not a trial order and be convinced?

T. H. Lewthwaite Machine Co.
415 East 31st St., (Est. 1890) New York City

**This is only one of the
11 TYPES — 5 SIZES
Ask for a complete catalog**



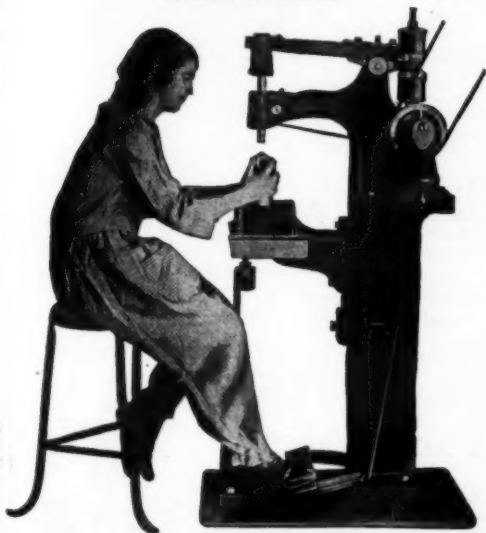
J. N. LAPOINTE CO.
NEW LONDON, CONN.

Makers of Broaching Machines and Broaches.

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

To handle rivets from the smallest, up to 1½" in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.

Rochester, New York

Weigel Double - Wheel "Trukaster"

Has heavy plates and axles. Easiest running, strongest and most durable double-wheel caster made. Lasts three times as long as others.

"Kwality Kaster"

(See Illustration)

The strongest and most durable single caster. Won't crush or break. Swivels on steel machined rollers.

Write for Price List

**THE HAMILTON
CASTER & MFG. CO.
HAMILTON, OHIO**



Partridge Light Punch Press

For making novelties from sheet metal, including such operations as stamping, blanking, piercing, bending, forming, perforating, embossing, shearing and wire cutting. Has exceptional strength for its size.

Carefully adjusted to secure accurate working of the dies, and to prevent shearing. Pendulum action of lever gives a stroke of maximum power without tiring operator. Workmanship and material the best.

Write me for the interesting price

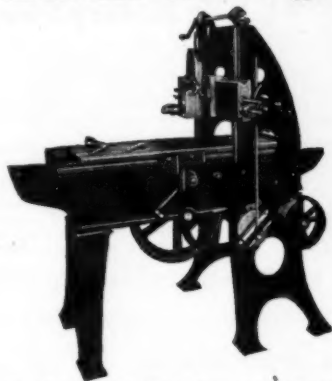
**E. O. PARTRIDGE, 2041-2049 CHICAGO
W. Lake St.**

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels



A Light-Weight Champion

The Lee Planer—Small but Rugged



Made in Sizes 16x16x42" and 16x16x54"

A stiff and powerfully geared small machine. The bed is of unusual depth and thoroughly braced internally. The uprights extend to the floor, forming a substantial support directly under the weight and strain of cut.

The Lee Planer means *lower costs on lighter work*. Jobs which are too small for most planers but are too large for the average shaper are the very ones for which the "Lee" is especially adapted. It works with accuracy and rapidity and effects a great saving in overhead, power, labor, time and space.

A valuable asset in both tool room and manufacturing department.

Get our literature and you will want the planer

The Frank H. Lee Co.

MACHINERY DIVISION

Danbury, Conn., U. S. A.

A machine that has lowered considerably
the cost of reducing small stock



The Etna Rotary Swager

A great many plants might cheapen their product and increase production by installing the "Etna". A number of concerns which have replaced power hammers with the "Etna" have increased production 500 to 1000%.

The metal, after being swaged, is more elastic, more dense, and, if steel, offers greater resistance to rust. The finished product is a perfect round. The "Etna" is made in regular sizes to swage $\frac{1}{2}$ " to $4\frac{1}{2}$ ". Send us samples or blue-prints of your work and let us figure how it can best be done.

The Etna Manufacturing Co., TOLEDO,
OHIO

A Blessing To every user of Bar Stock



Yes, it's really a blessing for anyone who has pipe, shafting or bars lying around his shop, to install one of our

"Handiest Racks"

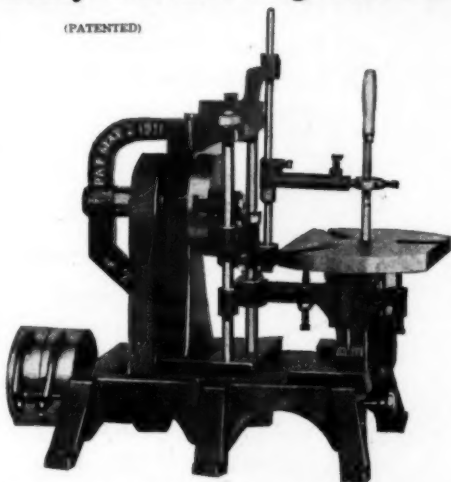
and see how it enables him to tidy up the place. It keeps such stock out of the way in a fourth the space, where it is easy to assort, count, and handle on or off. Don't be without it any longer.

*On trial? Sure.
Come right ahead.*

Wm. S. Yohe Supply Co.
503 Mahoning Road, N. E., Canton, Ohio

Barry No. 2 Filing Machine

(PATENTED)



The Barry Filing Machine is more than the name implies—inasmuch as it will do sawing and lapping equally as well as filing. The holders are patented and will readily take all shapes of standard or special files, saws, lapping stones or similar tools.

This machine can be used in many ways besides the sawing and filing out of dies, cams, templates, etc.

There are several thousand of these in use thruout the country and wherever they go they make good friends.

Built in several sizes for motor or belt drive

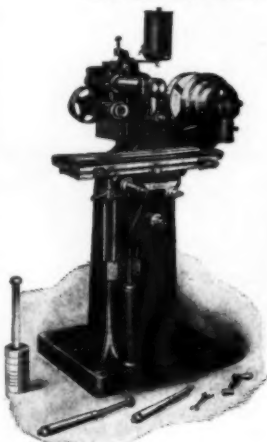
Write for catalogue today

Barry Manufacturing Company

515 West Monroe Street, Chicago, Ill.

A Better Small Miller

An Economical Producer
Of Small Machine Parts



No. 1
U. S.
Improved
Hand
and Weight
Feed
Milling
Machine

- (1)—A wide range.
- (2)—Quick adaptability.
- (3)—Great power for its size.

The above features enable it to handle an unusual variety of work with great economy, often in much less time than is possible on big, costly machines.

Furnished, if desired, with Universal Milling Attachment, or with Plain Milling Attachment, or arranged for motor drive.

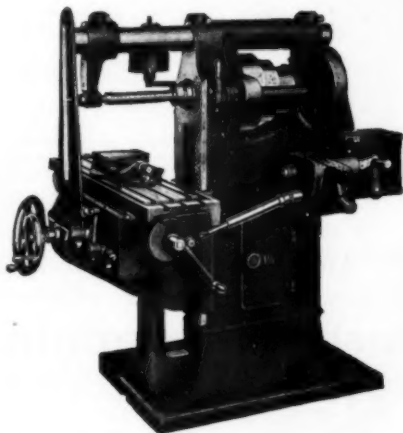
May we send the complete specifications?

The United States Machine Tool Co.

Cincinnati, Ohio, U. S. A.

The American No. 1½
Plain Back Geared Miller

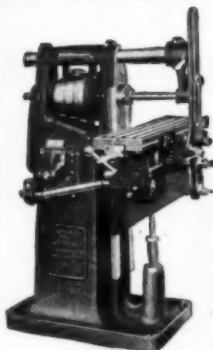
Quick—Accurate—Dependable



This strong, simple and convenient machine is built with an ample distribution of metal to take care of all strains, with wide bearings, accurate alignment, easy adjustments, and an ample oiling system. We do not believe you can find its superior for any work within its capacity. The quantity and quality of its output make it a dependable manufacturing tool of the first class. Furnished with Vertical Spindle Milling Attachment if desired.

Want specifications? Pleased to send them.

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.



Davenport 2-B Plain Miller

Powerful—Accurate

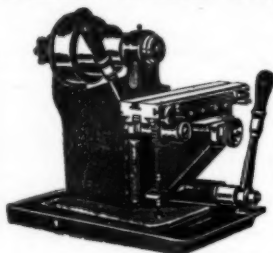
We believe this modern miller has no equal, and certainly no superior, in its combination of power, accuracy, convenience and range of usefulness.

The original construction of arbor support insures long life without wear, prevents chatter and makes possible the finest accuracy on parts requiring exact spacing and thickness. Quick change gear box provides 12 speeds.

Write for folder, describing its many points of merit

THE DAVENPORT MFG. CO., Meadville, Pa.

Just The Machine



for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

"Whitney" Hand Miller

THOUSANDS IN USE



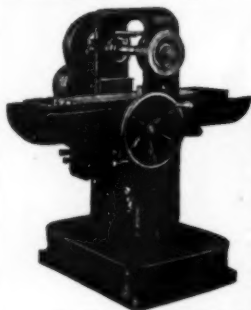
The Milling Machine with the SLIDING HEAD. No other design equals it for speed, accuracy, economy, and convenience. Useful every day in the year on countless operations.

Prompt Deliveries

The Whitney Mfg. Co., - Hartford, Conn.

Chains—Keys—Hand Milling Machines

Briggs High Duty Miller



**For Form and Gang
Milling of Steel Parts
For Guns, Autos, etc.**

ALSO an ideal machine for general use in your tool room and machine shop. We have incorporated in it the features most essential to rapid and accurate production and have eliminated all unnecessary complications and their attending weaknesses.

THE "BRIGGS" is a thoroughly satisfactory machine. Rigidly built, it will handle the heaviest cuts without chatter.

It will do for you what it does for others. Write us

GOOLEY & EDLUND, Inc., Cortland, N. Y.

Accuracy Helps Production

DICKOW'S 10-in. Universal Index Centers are built as accurate as human skill can make them, and their dependability in this respect is bound to save you labor and time.



**PROMPT
DELIVERY**



Patents Pending

Let us tell you about the improvements.

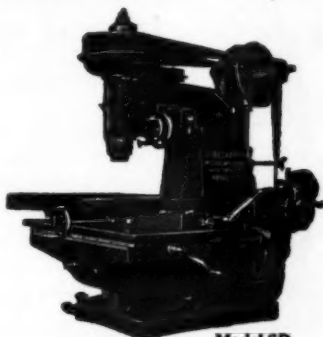
For Dependable Accuracy Get Dickow's

Sold by dealers. Write us for complete description.

Fred. C. Dickow, 1858 W. Lake St., Chicago, Ill.

BECKER

The Machine that Gives the Smooth Finish



Model SD

Superiority of Ranges

is a salient feature that has earned a high place in the Machine Tool Industry for

Becker Belt Driven Millers

The Internal Belt Drive provides an elastic feed to the spindle, eliminating chatter and prolonging the life of the cutter used.

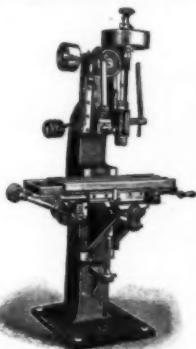
As a production tool The Becker is without an equal.

Circular S701 tells why. Write for it today

Becker Milling Machine Co.

Hyde Park, Boston, Mass.

Greater Milling Output



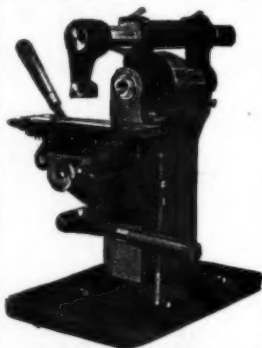
With a Clough No. 2 Vertical Miller With Slotting Attachment

Size of table..... 28"x9 $\frac{3}{4}$ "
Lengthwise auto feed 21"
Cross motion 9"
Vertical adjustment..... 15"

A rapid, economical, extremely accurate machine, adjustable to 1000's of an inch. Has six-speed, taper-bearing spindle. Unexcelled in many ways.

How about having our Catalog?

R. M. CLOUGH
Meriden, Conn.



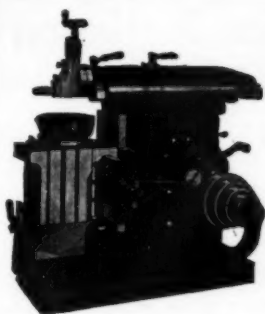
Burke's No. 3 Bench Millers Are Seasoned Tools

Our system of tests insures accuracy, and our methods of construction make it permanent. Frames and parts are carried 6 to 8 months, after work begins on them, before the completed tools receive our final O. K., and all parts are finished and fitted with exceptional care.

Longitudinal feed, 6 in.;
traverse feed, 3 $\frac{1}{2}$ in.; vertical
motion of knee, 8 $\frac{1}{2}$ in.; table
surface, 3 $\frac{1}{2}$ x12 inch.

Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
Conneaut, Ohio



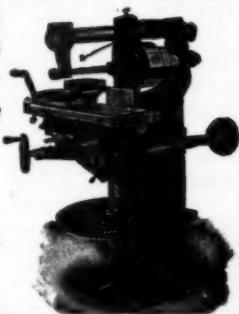
Steptoe Shapers *and* Millers

are the product of seventy-four years
of experience in the manufacture of

High Grade Machine Tools

Thousands of our machines in shops
giving daily satisfaction are a recom-
mendation for our product which should
not be overlooked
when buying shapers
and milling machines.

*We will be glad to send
catalogues on request*



—The—

John Steptoe Co.

Stock Yards Station

Cincinnati, Ohio

Big Millers Relieved

A W. & C. Dividing Head Transforms
a Hand Miller into a Semi-Universal



BY DOING your straight milling with the aid of these accurate centers, your big, high priced millers are left open for that difficult work. This greatly increases your capacity at very small expense.

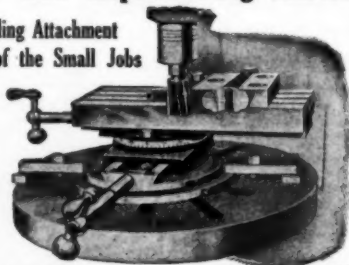
*Better order one now, and it will help to
offset the soaring costs of labor.*

Whiting & Comstock, 32 Union Place,
Hartford, Conn.
Export Department, 77 Broad St., New York City

Relieves and Replaces Big Millers

Davis Milling Attachment
Does 90% of the Small Jobs

Converts
any Drill
Press from
14 to 42-in.
swing in
2 Minutes



Relieves your large millers, comes in handy spotting castings, milling ends of bosses, etc., and does 90% of the lighter jobs as well as a \$1.00 machine; cuts keyseats perfectly. We also have low factory prices on our cylinder reamer for reboring the Ford car, and on our reliable air compressor. Write for details.

Hinckley Machine Works, HINCKLEY,
ILL.

No. 14 Duplex Universal Vertical Miller and Shaper

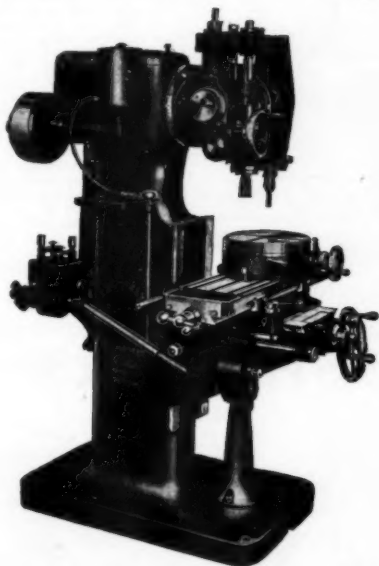


Table Feeds—9" Transverse. 18½" Longitudinal. 18" Vertical. Shaper Stroke Maximum 6". Vertical movement of Milling Spindle 3½". Heads adjustable 360 degrees right to left, and 40 degrees front or back from center.

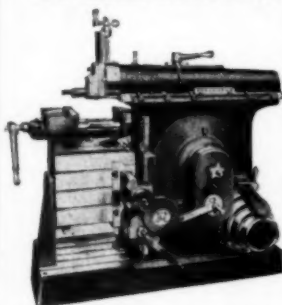
Machine will drill, bore, ream, slot and plane at any angle at one setting of the work.

Write for catalog

COCHRANE-BLY CO., Rochester, N. Y.

"Stamco" Crank Shaper

16' Back Geared—For Heavy Duty



The "Stamco" is built on a very firm, extra deep base. The column is also of extra depth, and of extra width at the base, making a more rigid joint between base and column and lowering the center of gravity. Wear caused by springing and friction is eliminated in the "Stamco."

All adjustments can be set to 1000's of an inch and can be made while the machine is in motion. Head and vise are graduated in degrees and can be set to any angle. Cross feed, 24"; vertical feed, 15".

Want Particulars?

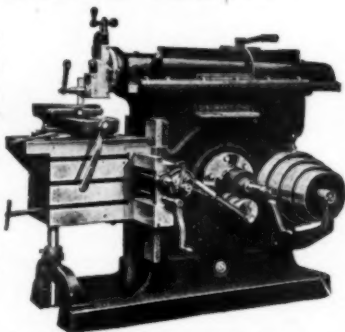
THE STREINE TOOL & MFG. CO.,

New Bremen, Ohio

SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Gear-
ed Crank,
Single Pul-
ley Drive.



The Smith & Mills Co. Station B.,
Cincinnati, O., U.S.A.



Rhodes 7" Horizontal 3½" Vertical Shaper

A versatile machine that is appreciated in any toolroom. As a horizontal shaper it has a 7" stroke, and it may be quickly and easily converted into a 3½" slotter, adjustable to 10 degrees. For accuracy it meets every requirement.

DEPT. H, L.

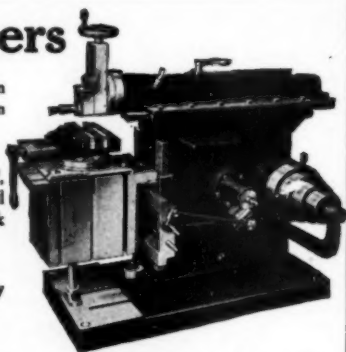
The Rhodes Mfg. Company
Hartford, Conn.

Shapers

The best medium priced Shaper on the market.

Built in 16", 20", and 24" sizes, all back geared crank machines.

A few for early delivery.



The Osborne & Sexton Mchy. Co.
Columbus, Ohio

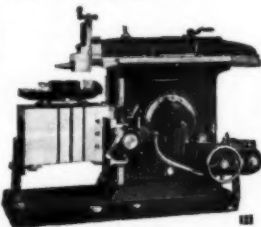
Columbia Heavy Duty Shapers

Massive and powerful
With latest operating conveniences
Machines you can depend on

Cut shows how we equip them with geared speed box, friction clutch and brake, suitable for single pulley or motor drive. Also furnished with cone drive.

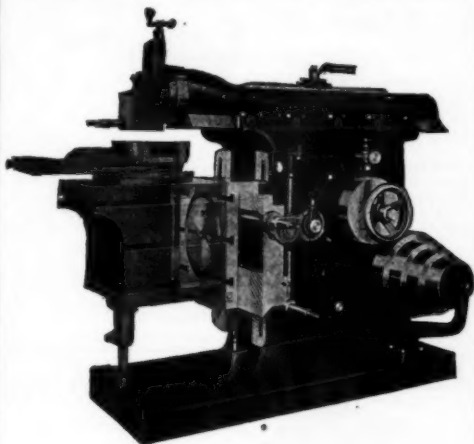
Sizes 16, 20, 24 and 28 in.

Write for detailed description



The Columbia Machine Tool Company
Hamilton, Ohio

Milwaukee Shapers



MILWAUKEE Back-Geared
Crank Shapers are built in
16-in., 20-in. and 24-in. sizes.

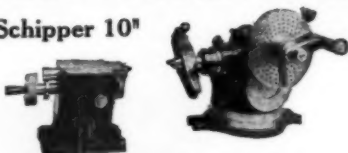
UNEXCELLED in Rigidity,
Accuracy, Power, Production
and Simplicity.

Milwaukee Shaper Co.

1144-1146-1148 Holton St., 518 Prairie St.,
Milwaukee, Wisconsin

For Tool Room or Manufacturing Work— Universal Index Centers

Schipper 10"



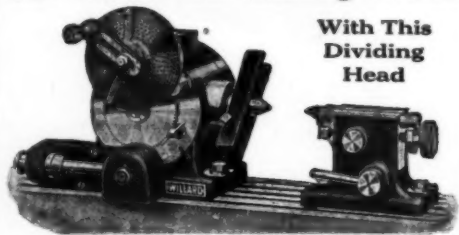
"Schipper" will greatly facilitate your milling work and will save much time and expense. Although they weigh but 85 lbs., they are exceptionally strong and rigid. They swing to limit of $10\frac{1}{2}^{\circ}$. The graduated head can be set at any angle from 10 degrees below the horizontal to 10 degrees beyond the perpendicular.

They are not expensive. Send for full details.

Schipper Machine & Tool Co.

Department of The Langhaar Ball Bearing Co.
Aurora, Indiana

Cut Costs On Milling Work



With This Dividing Head

Willard 10" Universal Dividing Head

Centers swing 10" in diameter. Clamping device is unusually rigid in every position. Spindle has No. 10 B. & S. taper, is accurately ground and is easily adjusted for wear. One index plate allows indexing up to 100; a chart shows divisions obtainable up to 380. Made either right or left hand.

Write for details.

THE WILLARD PRESS & TOOL CO.,

CINCINNATI, O.

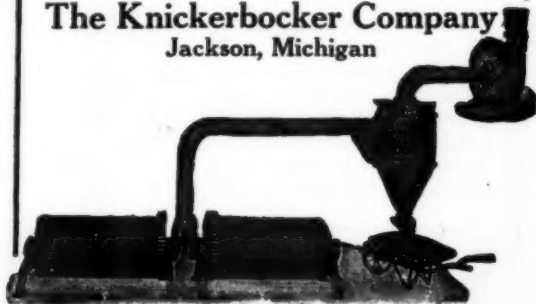


Knickerbocker asks you
to note that the "Rarefied"
Dust Collectors have these
points of superiority:—

- ¶ The suction never varies.
- ¶ They collect *all* the dust heavier than air.
- ¶ The material collected is discharged *automatically*.
- ¶ There is no cleaning out by hand.
- ¶ There is no filling up of cloth or screens.
- ¶ There are no moving parts.
- ¶ There is no cutting out of fan.
- ¶ The inner separating walls are interchangeable.
- ¶ There is no undue wear on Collector parts.
- ¶ The cost of repairs is very slight.

*Their superiority has made them favorites in many
big plants. Write for Booklet and list of users*

The Knickerbocker Company
Jackson, Michigan



Greater Production with "Demco" No. 40 Drilling, Milling and Tapping Machine

The many advantages of drill press and tapping machine in combination are obvious; and a machine that also will do milling is especially valuable in the tool room. This "Demco" No. 40 is especially adapted to and very useful for the making of jigs, dies, etc.

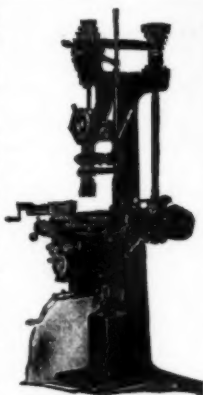
Special features include quick returning spindle, Demco adjustable quill bracket, vertical drive shaft with bevel gears running in grease, etc.

Write for complete details

The Demco Machine Tool Co.

Successors to

The DeMooy Machine Co.
706 Frankfort St., N.W. Cleveland, O.



A Lot of Drilling Capacity

This 16-inch, No. 7 Drill is a sturdy, reliable, highly efficient sensitive that will give you more service and satisfaction than you have ever bought for so small a sum. Takes drills up to $\frac{3}{4}$ -inch, and handles them effectively. It gets results.

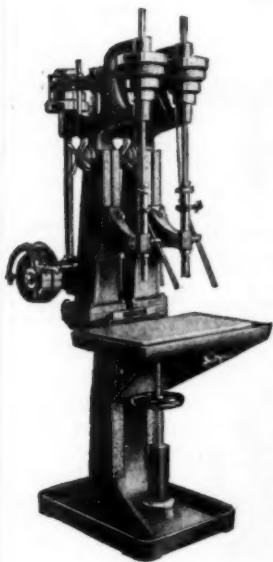
*Let us have your address for
complete description.*



Francis Reed Co., 43 Hammond St., Worcester, Mass.

EMBODIES UNUSUAL POWER

The EDLUND—a Superior Machine
That Gives Superior Service



This improved sensitive drilling machine has drive and cone pulleys of large diameter, which enable it to develop an unusual amount of power. Built with 1 to 6 spindles.

Rigidity

The upper frame is built in one piece casting, and all bearing surfaces are extra large, which makes the Edlund extremely rigid. And this, with the SKF ball bearings thruout, give it that smoothness of operation that augments accuracy and efficiency. A straight endless belt is used in transmitting the power, thus eliminating the objectionable quarter turn.

Let us send you full specifications and the price

Edlund Machinery Company, Inc.

250 Huntington Ave.,

Cortland, N. Y., U. S. A.



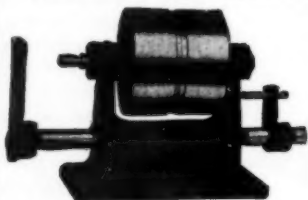
Burke 10" Bench Drill Motor Driven

Extremely accurate, very sensitive and of *Burke Quality*. Has double flanged top cone mounted on large bearing through which spindle runs. Spindle thrust taken on a ball bearing. Furnished with a. c. or d. c. General Electric Motor. Also belt driven.

The Burke Machine Tool Co., Conneaut, Ohio

Burke Tapping Machine

Another Tool of Burke Quality



Pin Clutch Drive
 $\frac{1}{4}$ " capacity, \$20.

Friction Drive
 $\frac{3}{8}$ " capacity, \$20.
 $\frac{1}{2}$ " " 35.
 $\frac{5}{8}$ " " 50.

BUILT throughout with exceptional care, our several sizes give service in proportion. Accurate, rapid and convenient, they give solid satisfaction.

Send for details today

The Burke Machine Tool Co., Conneaut, Ohio

Drills With the Greatest Pull

Aurora Drills

Have such a large pulley diameter and ratio of gearing that their pulling capacity is greater than that of any other drills made. Many users tell us that this is demonstrated in actual shop performance.

These drills are heavy without being clumsy. They are furnished with Patent Tapping Attachment, Compound Table, six change Feed Box, and can be supplied for either belt or motor drive.

Up-to-date methods and low overhead enable us to put into this machine an extra value for the price.



22"
to
36"

Write for Catalog

DRILLING TESTS OF 24" AND 26" DRILL

Size of Hole	Spindle Speed	Feed per Minute	MATERIAL
1"	360	9 1/2"	Cast Iron
1"	360	6 1/2"	Mild Steel
1 1/4"	350	6 1/2"	Mild Steel
1 1/2"	350	9"	Cast Iron
1 3/4"	225	5 1/2"	Mild Steel
2"	225	6 1/2"	Cast Iron

The Aurora Tool Works
Aurora, Indiana, U. S. A.



"Buhr" Drill Heads

Adjustable and Fixed Center

All-Ball-Bearing

Adjustable from 2 to 12
spindles.

Fixed center, any number
of spindles.

We guarantee our Heads
to stand up to capacity.

Nelson-Blanck Mfg. Company
Detroit, Mich.

No More Time Is Required

For Simultaneously Drilling 3 Holes With

**Sellew Adjustable
** Drill Heads ****

than is now required for
you to drill only one
hole. If you are an econ-
omizer, you will avail
yourself of this

"3-to-1" Economy

We also make Special
Drill Heads with fixed
spindles.

*Drop us a line and we'll
help you save money*



SELLEW MACHINE TOOL CO.,

**Pawtucket,
Rhode Island**



IT PAYS TO USE

The Sipp Quick-Change-Speed Drill

Because, while unusually massive, it is extremely sensitive.

Write for Bulletin No. 4

The Sipp Machine Company

Keen Street, PATERSON, N. J.



Stop and Think—

what it means to break a tap in a nearly finished piece of work: it means that it is practically ruined. One instance of this kind and you have probably lost more than the cost of a

Woodstock Improved No-Tap-Breakage Chuck

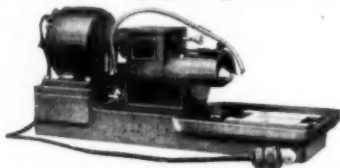
With this device you can get about 99% of the strength of the tap, and still not have it break. It saves material, time and money. Uses standard taps.

Made in Five Sizes

Used by U. S. Armies. For details, write to

Peter Bros. Mfg. Co. 115 Railroad St.,
ALCONQUIN, ILL.

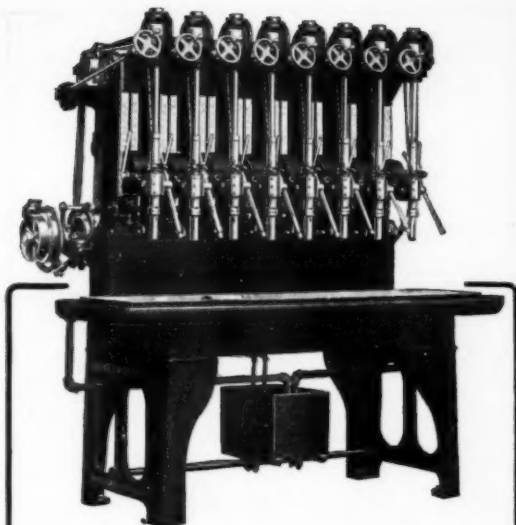
Bicknell-Thomas 0 to 1/4" Friction Tapping Machine



The most simple, durable, completely equipped, compact, easiest operated and most productive bench tapping machine built. The cone friction drive is automatically adjusted by the pressure the operator puts on spindle, making an extremely sensitive drive, saving time and taps and increasing output. Furnished for either direct or alternating current.

You should have specifications; may we send them?

Bicknell-Thomas Company
90 Wells Street, Greenfield, Mass.



Henry & Wrights 1 to 8 Spindles, for $\frac{1}{8}$ " Drills & Smaller

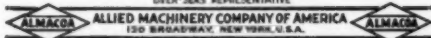
Henry & Wrights hold records for both high production and low costs, because they are better machines—because their gearless power transmission with frictionless bearings, with other H. & W. improvements, give them a productive capacity that is not approached by other sensitive drilling machines.

Tell us the number and size of holes you are drilling and we'll tell you approximately how much better you can do it with our machines. Let us show you how we can help you lower costs.

Write for Catalog and our free Feed and Speed Chart

The Henry & Wright Mfg. Co.
760 Windsor St., Hartford, Conn.

OVER-SEAS REPRESENTATIVE



Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

The LAMBERT Horizontal Insures Maximum Production

Combines the closest accuracy with extreme simplicity and thorough efficiency.

For
**Boring
Milling
Drilling**

Bronze bushings and all-steel gearing. Verniers provide head and outer support adjustments.

An economy tool

Start, stop or reverse any feed with this lever

Start or stop the bar with this lever.

The Lambert Machine & Engineering Company
Cleveland, Ohio, U. S. A.

P. & H. Drilling and Boring Machine

No. 12



1. Rapid traverse in each direction can readily be manipulated by slight adjustments on the hand wheel.

2. The spindle speeds are obtained by quick change gears and variable speed motor for either A. C. or D. C. current resulting in the following speed variations:

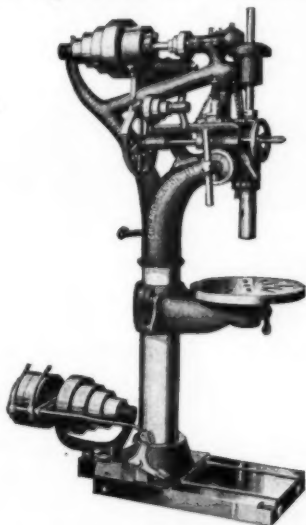
A. C. Current, 12 to 542 R. P. M.

D. C. Current, 10 to 445 R. P. M.

3. The four changes of feed available for each speed are made by the operator without leaving his position near front end of spindle.

Pawling & Harnischfeger Company
Milwaukee, Wisconsin

Let Us Show You Why
Canedy-Otto 20" Drills Excel



Canedy-Otto 20" Power Drills are exceptionally rugged without being clumsy. They combine simplicity, speed in operation and perfect accuracy for drilling holes up to $1\frac{1}{2}$ ", with all the graduated and automatic features of high-priced drills. The bearings are large and are made of the best babbitt metal, with hydraulically pressed graphite cones, which increase the life of the bearings 300 to 400%. Furnished for belt drive, or with a powerful direct-connected motor with all-spur-gear drive.

You can't do better; write for description and moderate price

Canedy-Otto Mfg. Company
Chicago Heights, Ill.

Manufacturers of Forges, Blowers, Drills, Lathes and Grinders

Model "E-50" Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Can be furnished with special pulleys to drive main spindle any speed up to 10,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", an . will take work up to $4\frac{3}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

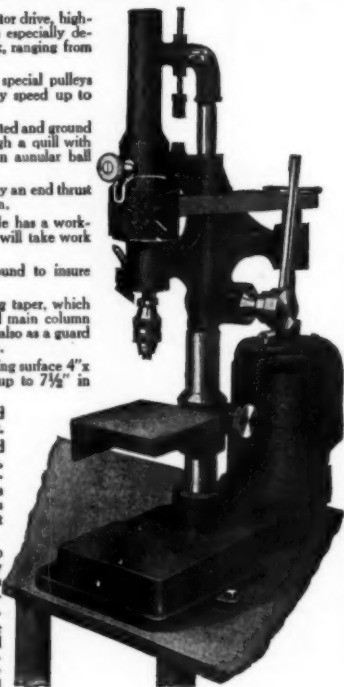
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.



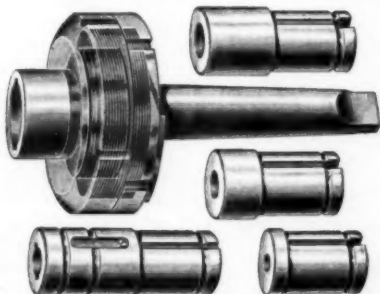
Height over all.....24"
Base..... $7\frac{1}{2}$ " x 18"
Diameter of spindle..... $7/16$ "

Spindle feed..... $2\frac{1}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

Beaman & Smith SAFETY Drill and Tap Holder—

Superior in Convenience and Simplicity



Made in Four Sizes, Covering 0 to 2½ inch Diameter

Tap breakage is prevented because the "Safety" is friction driven, which causes spindle to revolve under any undue strain. It permits tapping to the bottom.

No need to stop the spindle while changing from drill to tap, so that all lost motion is practically eliminated. The top-notch efficiency and reliability of "Safeties" have made them popular with proprietors and operators in all parts of the country.

They will help you to save tools, time, labor and money. A trial order is solicited.

The Beaman & Smith Co.
Providence, Rhode Island

20" Hoosier Drill Massive — Rigid

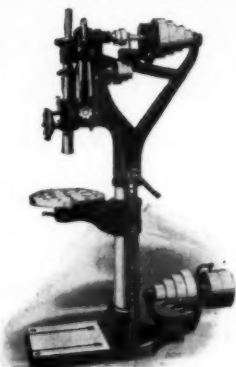
This drill is unusually heavy and strong and rigid, the net weight being 100 to 150 pounds more than the ordinary 20" drill.

It has stationary head, back gear, power feed, automatic stop and an exceptionally wide range of feeds and speeds.

Particular care is given to the alignment of spindle, fitting of gears, and to all those important details which distinguish the "Hoosier" as a tool of real merit.

Full details on request

Hoosier Drilling Machine Co., Goshen, Ind.



HAWES Radial Drill



We manufacture both wheel and belt polishing machines; Semi - Automatic polishing and grinding machines; Emery grinders, 10 in. to 10 ft. center to center of wheels; Gang Drills.

We manufacture machines in both belt and motor driven type.

Write for Bulletin No. 10

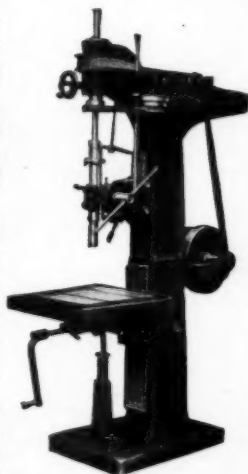
C. L. HAWES, Ashtabula, Ohio, U. S. A.

Avey No. 3

Heavy Duty Ball Bearing Drilling Machine

Designed for quantity and quality production on all classes of drilling. Much higher speeds can be obtained than ordinarily used for holes from $\frac{3}{4}$ in. to $1\frac{1}{8}$ in., combined with finer feeds, makes a production increase of from 25 to 50% possible.

Built in combinations of one to six spindles with plain hand or power feed. Ball bearings throughout.



Our No. 3 machine provides maximum speeds for work up to $1\frac{1}{8}$ ".

Write for Bulletin containing details

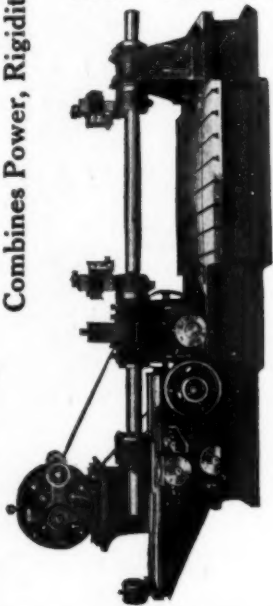
The Cincinnati Pulley Machinery Co.
Cincinnati, Ohio

Bores Out a Cylinder 48-in. Long at One Setting

Combines Power, Rigidity and Convenience

The No. 2 "Barrett" horizontal cylinder boring machine is of unusual efficiency and capacity. The patented quick change mechanism provides 10 different feeds.

The bed is 13 ft. 1 in. long—widened portion 48 in. wide by 56 in. long, and 18 in. high. The boring bar is 5 in. in diameter, with a continuous travel of 46 in. in either direction. We recommend the use of a 10 h. p., variable speed, 4 to 1 motor.



We invite you to write us about this and other up-to-date machines

BARRETT MACHINE TOOL COMPANY, - - Meadville, Pa.

Builders of all sizes of Single and Double Bar Horizontal Cylinder Boring Machines for boring and facing simultaneously steam, gas, gasoline, pump and locomotive cylinders, also for boring the guides of engine frames and facing off end, besides boring and facing the crank shaft bearings simultaneously.

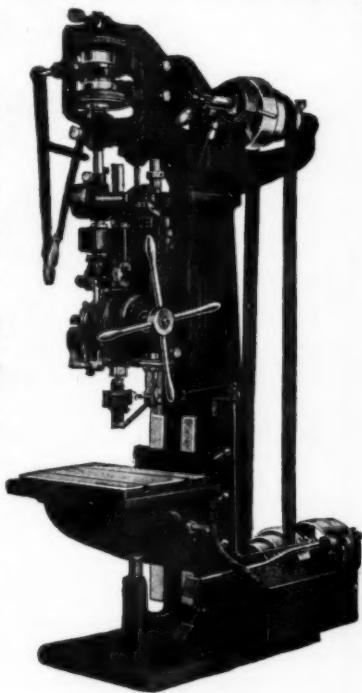
A New Cost Reducer—

The Turner Turret not only saves time, but it makes it easy for your operators to do accurate work. Think of the economy in completing a series of operations at one setting of the work!

Each spindle carries a different tool which successively and automatically registers in precisely the same position. This feature is not complicated, and machine can be operated at full capacity by any ordinary workman. The

Turner Turret

also has available an extremely wide range of speeds by means of minor gear changes. In short, a "Turner" is as much superior to a common drill press as a turret lathe is superior to a common lathe. Full data in Bulletin FH. The Quint Turret is described in Bulletin QH.



TURNER TURRET

Turner Machine Company
DANBURY, CONN. and Newark, N. J.
Incorporated with Turner, Atherton & Co., Ltd.,
Denton, Manchester and Stockport, England



This Taylor & Fenn 3-Foot Radial Drills Holes and Cuts Costs

If you have drilling to do up to $\frac{3}{4}$ in. in big, hard-to-handle pieces, this exceptionally handy machine can save you money. Its wide range and quick action, its convenience of adjustment, its dependable accuracy, and its low consumption of power all combine to make it a tool that lowers manufacturing costs.

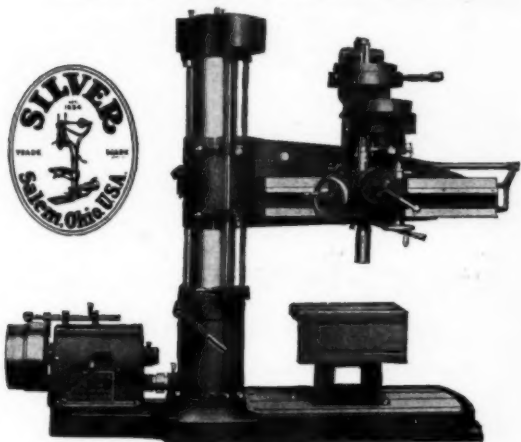
We could not say beforehand just how much it would save on your work, but we do know that in some shops it has doubled and even trebled previous outputs.

*Ask us to mail you our production records
and cost comparisons—all interesting data*

The Taylor & Fenn Company
Hartford, Conn.

Silver Radials

Help Maintain Top-Notch Production



Built in 2½, 3 and 3½ Foot Sizes

SILVER RADIALS are the improved product of a manufacturing organization which has been making drilling machines for more than 65 years. They embody the latest and best in modern machine shop practice, and a number of exclusive features besides.

The inner column or post has a wide bearing on the base and extends to the top without taper. Heavy ribs run nearly its whole length and are of such size that they just clear the drive shaft, giving it superior strength and rigidity. One of the exclusive features is the "safety nut," which prevents the arm from dropping when the threads become worn in the elevating nut. There are eight changes of feed.

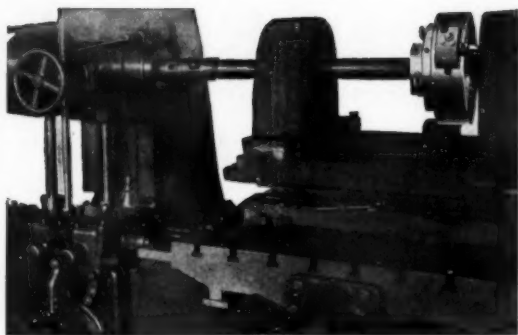
Write for illustrated circular giving full details

The Silver Manufacturing Co.

Box 295, Salem, Ohio, U. S. A. Founded 1854

LONDON PARIS BRUSSELS NEW YORK GENOA SIDNEY CAPE TOWN

Silver radials made by the builders of the famous Silver line of 20 and 25" drills



Mummert-Dixon Facing Heads In Operation on a Boring Mill

Note how easily the Facing Head adjusts for this work. The tool is fed automatically across the face of the head, working either in or out, completing the operation without change or adjustment. It will do the work accurately and at the same time more quickly and at less cost than any other tool or set-up.

These heads are made in six different sizes, and are available for use on any machine carrying a spindle or that will operate a bar. They work on lathes, milling machines, drill presses, boring machines, etc., and in every case show a decided economy in time used and in the cost of the operation. The ordinary lathe tool is used, and the operation is in effect the same as facing on the lathe.

The virtue in these facing heads is their economy of time and cost. If you will let us, we shall be glad to show you how they can expedite your work and save you money.

Let us have your address, please

MUMMERT-DIXON CO., Hanover, Pa.

DRILLING FOR PROFIT



HAMMOND

**Sensitive High-Speed
Radial Drills**

Wherever there is light drilling and tapping to do a "Hammond Radial" should be installed. The flexible arm, which can be moved almost instantly from hole to hole, speeds up the work and reduces your production costs.

*Write and find out how you can cut your
light drilling and tapping costs 25% to 33%*

The Hammond Mfg. Co.
Cleveland, Ohio, U. S. A.

A Versatile Tool—the Rockford Horizontal

**A Heavy Duty Tool That Bores, Drills
or Taps Anywhere on a Surface 18" x 36"**

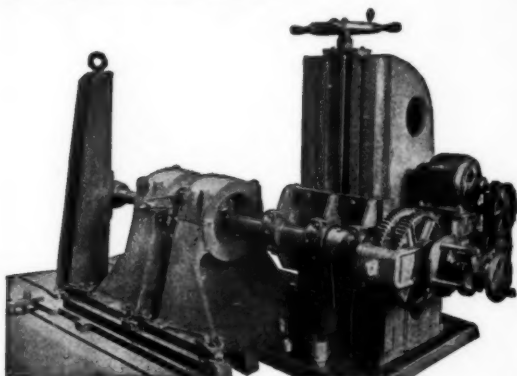
The lateral and vertical adjustment of the head give the machine this exceptionally wide range, and adapt it to such a variety of work—especially large, irregular shaped pieces which other machines cannot handle—that its usefulness is almost unlimited. It has the accuracy required for the finest tool and jig work, and at the same time the power and capacity for 2" drills, and for boring to 6" or even more. It is quick and economical on a lot of work that by other methods you can do only slowly and expensively.

Do not miss this for 1920



THE ROCKFORD DRILLING MACHINE CO., ROCKFORD, ILL.

Here It Is!



Pedrick Column Boring Machine

A new machine, extremely simple but capable of lots of work. In fact, with the two methods of operating the boring bar it possesses certain advantages not otherwise obtainable. (1) The boring bar travels or (2) a cutterhead feeds along the bar. The same mechanism does it all, the change being made almost instantly.

Write for a circular and get the whole story

Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

Builders of Portable Boring Bars, Crank Pin
Machines, Pipe Benders, etc.

"Standard" Portable Electric Tools

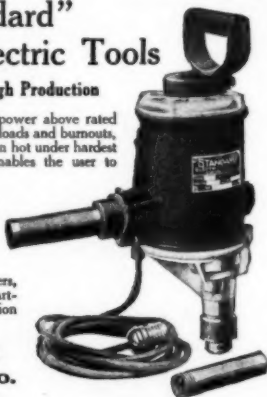
High Power—High Production

They have an excess of power above rated capacity, which prevents overloads and burnouts, and are guaranteed not to run hot under hardest continuous service. This enables the user to push them to the limit.

They are built of five simple units, are light for their great rigidity, and fool-proof. Equipped with dust-proof ball bearings.

Write for list of satisfied users, and ask our Engineering Department for special information covering your needs.

**The Standard
Electric Tool Co.
Cincinnati, Ohio**



For Big Production

The Minster Jr. Drill

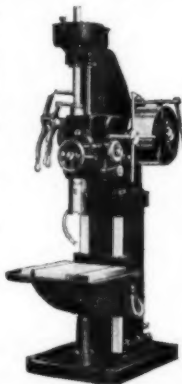
A high-grade, single purpose drill having a simple general construction and as few parts as possible. It maintains our high standard throughout, and is *very useful and efficient in large production shops*. It is perfectly lubricated at all times, and operates on a small amount of power.

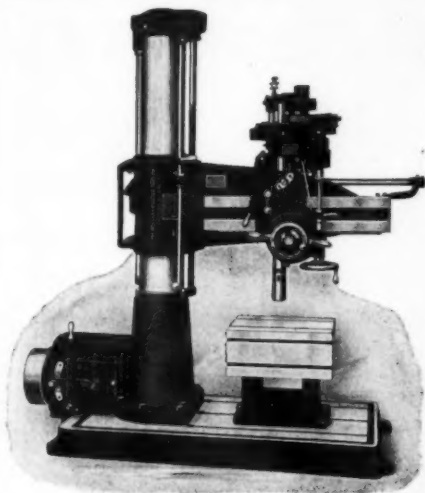
The "Minster Jr." is furnished with either plain or compound table. Each is provided with ample oil grooves. This drill has 6 speed and 4 feed changes, but any desired speeds and feeds may be obtained by changing gears. This feature allows its being used on a large range of work and on heavy boring. It also has a very efficient feed disengaging device which may be set to fractions of an inch.

Write for Bulletin No. 30

MACHINE TOOL DEPT.

**Minster Machine Co.
Minster, Ohio**





Mueller Radial Drills

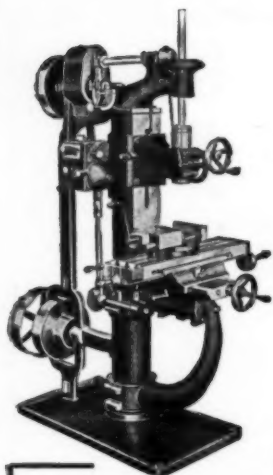
Are noted for their almost unlimited pulling capacity. The secret of this is our patented friction clutch. Not a set screw on this clutch of ours. It cannot slip. Nothing about it to wear out or to give trouble. Simple in every sense of the word. It is only one of the many distinctive features of the MUELLER Radial. The whole story is quite interesting. If you want to hear it write to

The Mueller Machine Tool Company

ESTABLISHED 1902

Radial Drills and Lathes.

CINCINNATI, O.



A Greater Choice

**Knight Milling
and Drilling Ma-
chines are now
made in four sizes**

THERE HAS BEEN such a strong demand for these "production boosters" that we felt warranted in adding another to the "family."

Their superior convenience—they often help to solve difficult machining problems—have made them prime favorites in shops of every size in all parts of the country.

Knights not only do dependable work, but they save time in tool room and shop. Set the job, and you can complete it without resetting.

Illustrated circulars on request

W. B. Knight Machinery Co.

3920 W. Pine St., St. Louis, Mo.

“Van Dorn”
ELECTRIC DRILL

Portable
Electric
Drills

The *Van Dorn* Electric Tool Co.
Cleveland, O.

Automatic Screw Driving

At a Labor Saving of 75 to 85 Per Cent
Giving the Work a Machine-Made Finish

Dump a gross of
wood or machine
screws here

Then press a foot
lever and screws
are automatically
magazined and driv-
en to desired depth



Reynolds Magazine Fed Automatic

Drives practically any kind of wood or machine screws, hex.-head, square head or filister head cap screws at the rate of 8,000 to 16,000 a day. In practical, successful use by many of the best concerns in the country. Puts screw driving on a real manufacturing basis. Each size or style handles several sizes of screws, and each machine saves the wages of two to five men.

There is a "Reynolds" for YOUR requirements

The Reynolds Machine Company

Dept. H.H., Massillon, Ohio

Thor Universal Electric Drills

Licensed Under Burke Universal Motor Patent

No. 0
 $\frac{3}{8}$ -inch
Drilling Capacity



Ask for Circular No. 29

Indispensable for all kinds of drilling, reaming and wood-boring in the building of steel and wooden cars, boilers, automobiles, auto bodies and in railroad and structural shops and for machinery repairs.

Jacobs Chucks furnished as regular equipment.

Agents Wanted

**Independent Pneumatic
Tool Company**

Chicago	New York	Pittsburgh	Cleveland	Detroit
San Francisco	Birmingham	Montreal	Toronto	

Continuous Rotary Miller



**Castellating
Screw Slotting
Slab Milling
Straddle Milling**

High production. Positive accuracy. Low cost of operation.
Enquire of your dealer or write us for full details.

THE CRAFTSMAN TOOL CO.
CONNEAUT, OHIO

Victor Collapsible Taps



These strong and durable tools cut clean, sharp threads without possibility of injury, and reduce tapping time one-half. Easily adjusted for size—either under, over-size or standard. Regular sizes up to 6"; larger sizes to order. Let us show you money-saving possibilities in tapping, without obligation. The price won't frighten you either.

VICTOR TOOL COMPANY, - WAYNESBORO, PA.

Five Spindle Vertical Nut Tapping Machine



If we simply stated that the capacity of this machine was 20,000 $\frac{3}{8}$ " hot pressed square nuts per day, you would probably be a bit skeptical of our claims, but some of our customers are even exceeding this output on this size nut—we have prima-facie evidence, and we believe that this is considerably better than any other hand operated machine is turning out.

Taps are held upright, eliminating chips dropping into nut holders and consequent loss of time in frequently cleaning these out.

May we send descriptive matter?

The Webster & Perks Tool Co.

Box 1340, Springfield, Ohio, U. S. A.

Case-Hardo

Non-Poisonous Case Hardening Compound

Better—Quicker—Cheaper

Better, because it produces a glass-hard surface, of a good color, with deep penetration.

Quicker, because it requires less heat—only about 1400 degrees Fahr. when used in any cyanide furnace.

Cheaper, because it saves labor, fuel and time, it costs less, and it hardens more work than an equal weight of any other hardening compound.

Case Hardo has been tried and proven by over four years of successful use, and has behind it our reputation of over 30 years.

Manufactured By

The Thos. Buchanan Company

29 W. 3rd St.,

Cincinnati, Ohio

Established in 1886

CASEITE

The Standard Material for

(CYANIDE)

CASE HARDENING

Increase your production—produce harder and cleaner steel—more uniformity. In other words, CASEITE will give you the maximum output of highest quality at minimum cost.

Lump or Powdered

Write for Catalogue of other products

BELL & GOSSETT CO.

630 W. 30th St.,

Chicago



Why Does It Win?

Produces a Better Case—that's why

A better case because it is deeper and cleaner, and results are always uniform under similar conditions of properties of steel, temperature, length of exposure and quenching. The constancy of Ferro Case composition eliminates all uncertainty as to dependable work.

Economy

Ferro Case carbonizes at a lower temperature, and not only reduces first cost for material, but saves labor, time and fuel. It avoids crystalization, warping, blistering and wear on furnace linings, due to excessive heat. It does not deteriorate with age, making it safe for you to stock up freely.

Safety

Last, but not least, Ferro Case is safe. It is non-poisonous, and after one trial cyanide will be taboo in your plant forever after.

Ferro Case M is for use in the cyanide melting furnace, and is handled the same way.

Ferro Case S is for sprinkling on hot steel. Kindly state the grade desired.

*We solicit a trial order—repeat
orders take care of themselves*

C. G. Buchanan Chemical Co.

Sta. H., Cincinnati, Ohio, U. S. A.

Ex-Service Men Should Reinstate Their War Insurance

A new law just passed by Congress makes much more liberal provisions under all Government Life Insurance Policies, including one for the payment of a lump sum on the death of the insured.

Men who have allowed their government policies to lapse, should obtain from this Bureau full information as to their rights under the law, and the benefits to be derived from taking advantage of the new options.

Write for circular and blanks

**Insurance Division
Bureau of
War Risk Insurance
Washington, D. C.**

Tucker's Safety First

Oil Hole Covers

Require but one hand to pump in the oil. Adapted to all kinds of mechanism having oil holes leading to a bearing, and locate the parts to be lubricated.

*Send for Catalogue
Oil Hole Covers No. 5*



Style G, Closed



Style G, Open

Style E



Style C



Style F, Drive



Style A



Style D, Open



Style D, Closed



Rotary Head

W.C. & F.C. TUCKER, Hartford, Conn.

The "Giant"

Universal Joints for Heavy Service



Efficient to an angle of 45 Degrees

Vanderbeek Universal Ball Joints for higher angle drives

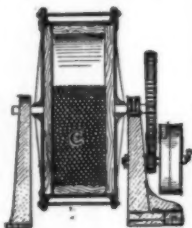
Sizes $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{5}{8}$, $1\frac{3}{4}$, $2\frac{1}{8}$ and $2\frac{1}{2}$ in.

Carefully built, dependable, time-tested, self-oiling and dirt-proof. Wear-ing ends are hardened steel. Stem ends are strong and well braced. Don't worry over your angular drive problems—put them up to us.

Ainslie Machine & Tool Works

Successors to Vanderbeek Tool Works
HARTFORD, CONN.

Small metal articles burnished better and at far less cost



Cheaper. One Abbot Burnishing Barrel replaces many polishing and buffing machines. One operator can handle several Abbott Barrels but only one polishing machine. The great difference in cost is obvious.

Better. The Abbott Burnishing Barrel, with its smooth, glass-hard steel burnishing balls, produces a brilliant finish without injury to the parts and without removing any surface material. It means an immense economy plus quality.

Write for copyrighted booklet and send samples for burnishing

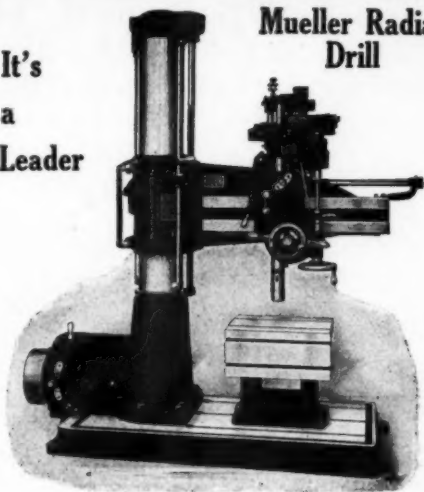
The Abbott Ball Company

Elmwood District, Hartford, Conn.

All sizes of burnishing balls and soap chips for immediate shipment

**It's
a
Leader**

Mueller Radial Drill



18 Years Old This Month

In February 1902 the first MUELLER radial drill made its appearance on the market. It made a hit without delay, and since then has been the favorite of discriminating users of radial drills. Why? Well, for many good reasons, but largely because it is a distinctive outfit and has never failed to make good. It's all there from the base up.

*If you want an introduction to this
exceptional radial drill, just write to*

The Mueller Machine Tool Company

ESTABLISHED 1902

Radial Drills and Lathes.

CINCINNATI, O.

Millng, Boring, Grinding, Etc.

At Any Desired Angle without Resetting
For Use on Any Type of Machine Tool



12"x18"

Protected
By Patents

Made in Sizes 4"x6", 6"x8", 8"x10" and 12"x18"

Right now it is advisable to save every moment of every man's time that can be profitably employed. And any device which both saves time and insures accuracy beyond all doubt, is of double value.

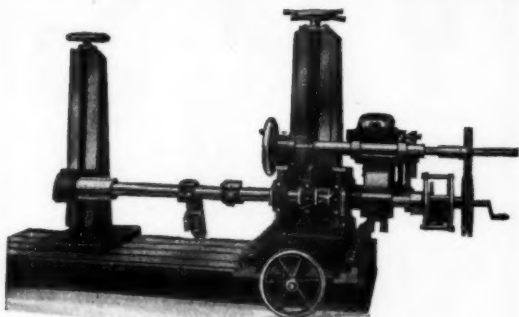
Our Universal Angle Plate

is set easily and quickly at any desired angle without disturbing the work bolted to the plate. The great time-saving over any makeshift device is apparent. It swivels on graduated base through a complete circle and tilts to 90 degrees. Venier attachment insures extreme accuracy. Used in numbers and with great satisfaction by U. S. Government, manufacturers of motor cars, machine tool builders and other big concerns throughout the country.

Write for folder and names of appreciative users

Boston Scale & Machine Co.
100 Ruggles St., Roxbury, Mass.

Two Methods Of Boring



If you have a Pedrick Column Boring Machine you are not limited to handling boring operations in only one way; you may have a choice of which method is better for the work in hand.

This is an exclusive feature of the Pedrick machine. Write for a bulletin which describes other advantages.

The No. 1 Size, shown above, has a 3½" bar. Other sizes have larger bars.

Bulletin ?

Pedrick Tool & Machine Co.

3644 North Lawrence Street

Philadelphia, Pa.



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO.
1940 SO. KILBOURN AVE., CHICAGO



Style "H"

Protect Your Bearings

Patented
Spring
Cover,
found only
in "Conus"
Oil Cups



Ask
for
catalog
and
sample.

WITH

CONUS

OIL CUPS

Made of high grade Swedish steel, heavy nicked. Installed without tapping.

Simple—Efficient—
Economical

American Galco Company,

SOLE DISTRIBUTORS

Grand Central Palace, New York City



This Taylor & Fenn 3-Foot Radial Drills Holes and Cuts Costs

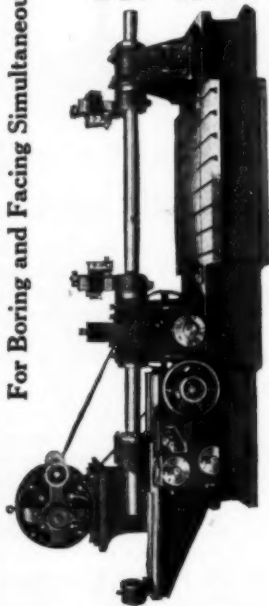
If you have drilling to do up to $\frac{3}{4}$ in. in big, hard-to-handle pieces, this exceptionally handy machine can save you money. Its wide range and quick action, its convenience of adjustment, its dependable accuracy, and its low consumption of power all combine to make it a tool that lowers manufacturing costs.

We could not say beforehand just how much it would save on your work, but we do know that in some shops it has doubled and even trebled previous outputs.

*Ask us to mail you our production records
and cost comparisons—all interesting data*

The Taylor & Fenn Company
Hartford, Conn.

Single and
Double Bar
Horizontal Cylinder Boring Machines
For Boring and Facing Simultaneously



Made in All Sizes

For boring and facing steam, gas, gasoline, pump and locomotive cylinders.

Also for boring the guides of engine frames and facing off end, besides boring and facing the crank shaft bearings simultaneously.

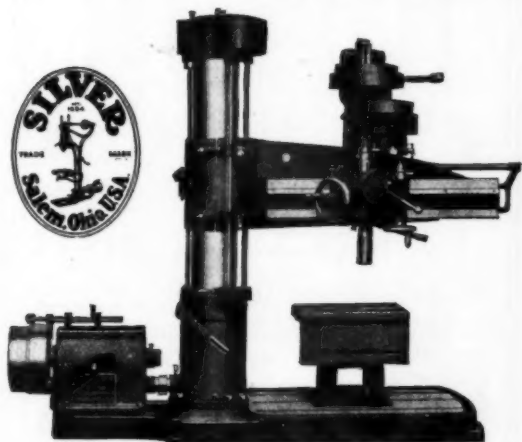
Furnished with belt or motor drive.

No. 2 Barrett, with 10 H. P. Variable Speed 4 to 1 Motor

The boring bar is 5" in diameter, with continuous feed travel in either direction of 48". It will bore out a cylinder of that length at one setting. The entire machine is constructed for great power, precision and convenience. Consult with us freely about your needs.

BARRETT MACHINE TOOL COMPANY, - - Meadville, Pa.

Have You Looked Into The New Line of Silver Radials?



Built in 2½, 3 and 3½ Foot Sizes

IN CASE YOU HAVE NOT, there's an agreeable surprise awaiting you. Silvers ought to be good—and they are—for we put in some four years experimenting and testing in every conceivable way before we O. K'd them.

And our 65 years of experience in building drilling machines surely takes us out of the amateur class. Silvers embody a number of patentable features not found on other drills, and which, for economy's sake, you ought to know about. Ask for the circular today.

The Silver Manufacturing Co.

Box 295, Salem, Ohio, U. S. A. Founded 1854
LONDON PARIS BRUSSELS NEW YORK GENOA SIDNEY CAPE TOWN

From 3 Operations—To 1



You can drill three holes in only one operation instead of in three operations when you employ

Sellew Adjustable ** Drill Heads **

Why continue the old way when these inexpensive tools will save you time and money?

Write for circulars



SELLEW MACHINE TOOL CO., Pawtucket, Rhode Island



"Buhr" Drill Heads

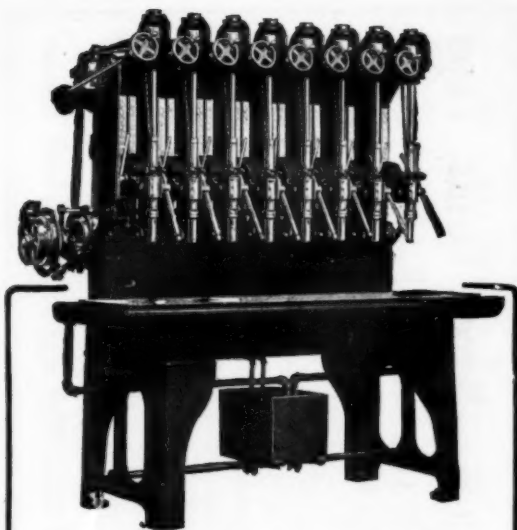
**Adjustable and Fixed Center
All-Ball-Bearing**

Adjustable from 2 to 12
spindles.

Fixed center, any number
of spindles.

We guarantee our Heads
to stand up to capacity.

Nelson-Blanck Mfg. Company
Detroit, Mich.



Henry & Wrights 1 to 8 Spindles, for $\frac{3}{8}$ " Drills & Smaller

The practical elimination of friction in driving the machine by gearless power transmission with frictionless bearings, means more power at the drilling point, greater production, fewer repairs and longer life. The adaptation of Henry & Wright machines to the scientific Feed and Speed Chart, printed in our Catalog, further increases production. With these and other H. & W. improvements, Henry & Wrights are fairly revolutionizing sensitive drilling.

Write for Catalog, with free Feed and Speed Chart

The Henry & Wright Mfg. Co.
760 Windsor St., Hartf. Conn.

OVER-SEAS REPRESENTATIVE



Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

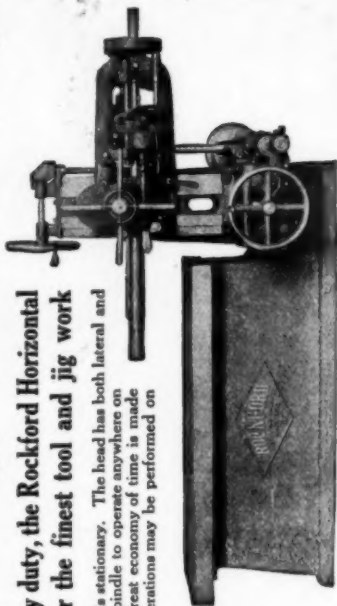
Of Exceptional Range—Bores, Drills, Taps

While built for heavy duty, the Rockford Horizontal has the accuracy for the finest tool and jig work

The table of this efficient machine is stationary. The head has both lateral and vertical adjustment, allowing the spindle to operate anywhere on a surface 18" high by 36" wide. Great economy of time is made possible because a number of operations may be performed on heavy, hard-to-handle work at one setting.

It has the power and capacity for 2" drills, and for boring to 6" or even more. It affords a choice of six driving combinations.

You will find the full specifications interesting—write us



THE ROCKFORD DRILLING MACHINE CO., Rockford, Illinois



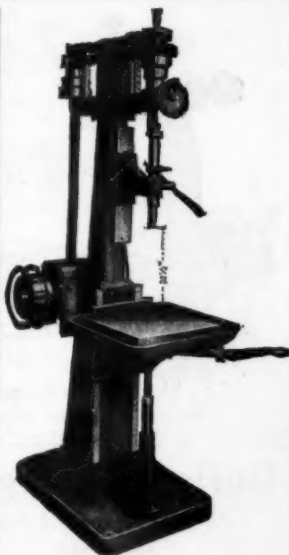
FEATURES

Quick
Change Speed
Change in 2 seconds

Most
Efficient Drive
No belt troubles

Safety First
All parts protected

Heaviest
Drill Made
Yet very sensitive
All Ball Bearings



The Right Speed

You get accuracy and bigger output with

The Sipp Quick-Change-Speed Drill

because the speed can be changed in two seconds, hence the right speed for the job will naturally be used.

Write for Bulletin No. 4

The Sipp Machine Co.

Keen St., Paterson, N. J.



Burke Quality

Excels on Fine Points

Machines of Burke Quality are never built with any name cast on the frame but our own—

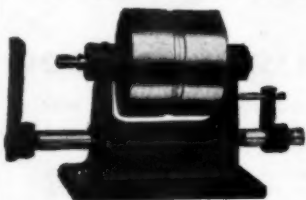
**BURKE
CONNEAUT
U. S. A.**

PRICE, \$24

Also Furnished Motor Driven

Burke Tapping Machine

Another Tool of Burke Quality



Pin Clutch Drive
 $\frac{1}{4}$ " capacity, \$20.

Friction Drive
 $\frac{3}{8}$ " capacity, \$20.
 $\frac{3}{4}$ " " 35.
 $\frac{5}{8}$ " " 50.

BUILT throughout with exceptional care, our several sizes give service in proportion. Accurate, rapid and convenient, they give solid satisfaction.

Send for details today

The Burke Machine Tool Co., **Conneaut, Ohio**

Model "E-50" Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Can be furnished with special pulleys to drive main spindle any speed up to 10,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", and will take work up to $4\frac{1}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

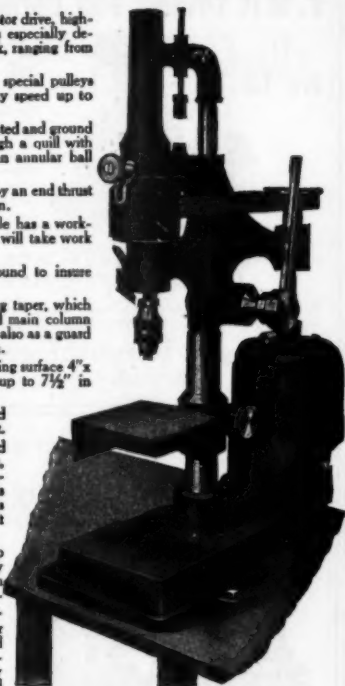
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.



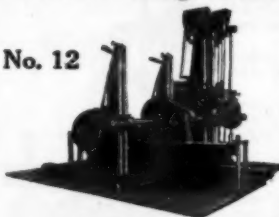
Height over all.....24"
Base..... $7\frac{1}{2}$ " x 18"
Diameter of spindle..... $\frac{7}{16}$ "

Spindle feed..... $\frac{2}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

P. & H. Drilling and Boring Machine

No. 12



1. Rapid traverse in each direction can readily be manipulated by slight adjustments on the hand wheel.

2. The spindle speeds are obtained by quick change gears and variable speed motor for either A. C. or D. C. current resulting in the following speed variations:

A. C. Current, 12 to 542 R. P. M.

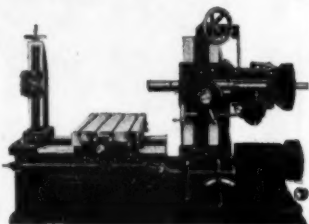
D. C. Current, 10 to 445 R. P. M.

3. The four changes of feed available for each speed are made by the operator without leaving his position near front end of spindle.

Pawling & Harnischfeger Company

Milwaukee, Wisconsin

The Morris Horizontal Boring and Drilling Machine



All steel gears.

All bronze bearings.

Helical spindle gears.

All levers directly at the hands of the operator.

Glad to mail large picture and full description upon request.

The Morris Machine Tool Co.

Cincinnati, Ohio, U. S. A.

Also Manufacturers of the Morris Line of Radial Drills

You have to go far to equal

Aurora 22" to 36" Drills

And the price is very attractive

The acid test of any drilling machine is the power and speed it can deliver at the drill point—because that determines the number of holes it will make in a given time.

Users and experts unite in supporting our claim that "Auroras" are superior in this vital feature. The large pulley diameter and the ratio of gearing are the plain reasons for this superiority.

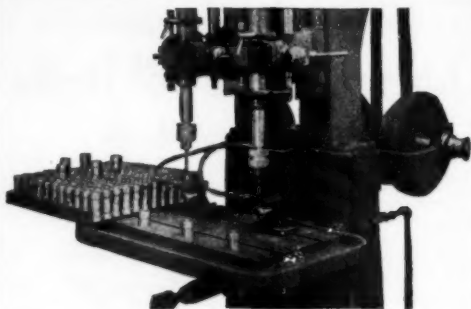
There are more good points, such as positive gears, enclosed in a box; a foolproof table; a worm wheel that drops automatically giving a positive release, etc.



Why not get acquainted? Give us an opportunity of telling you the whole story

The Aurora Tool Works

Aurora, Indiana, U. S. A.



THE *Avey* AUTOMATIC

Operator Does Nothing But Load Jigs

Provides automatic approach and automatic return.

Depth gauge can be set for any desired depth of hole.

The instant the drill withdraws, the operator reloads.

Quick hand approach without disengagement of power feed provided, absolutely prevents any idle feeding of spindle.

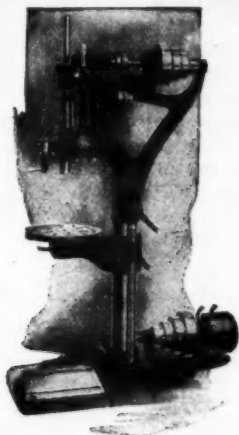
Automatic feed and cut-off to lubricant.

The operator handles as many spindles as the nature of work will allow.

THE MACHINE CROWDS THE OPERATOR. You can figure almost exactly what a day's output should be.

The Avey Drilling Machine Company
Cincinnati, Ohio

The Rockwell 20" DRILL PRESS



This low-priced drill press is of excellent design and workmanship. It is equipped with automatic feed, hand wheel and hand lever feeds.

The four-step cone drive and back gears afford a good variety of speed and feed changes. All adjustments are readily made. Capacity, 1¼-inch diameter at center of 20 inches.

This machine is ready for immediate shipment

Price \$165.00--f. o. b. cars Chicago

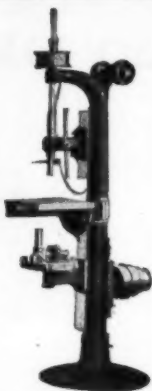
JOSEPH T. RYERSON & SON
MACHINERY

CHICAGO ST. LOUIS DETROIT BUFFALO NEW YORK

A Lot of Drilling Capacity

This 16-inch, No. 7 Drill is a sturdy, reliable, highly efficient sensitive that will give you more service and satisfaction than you have ever bought for so small a sum. Takes drills up to $\frac{3}{4}$ -inch, and handles them effectively. It gets results.

Let us have your address for complete description.



Francis Reed Co., 43 Hammond St., Worcester, Mass.

Hoosier Drills 20" Vertical

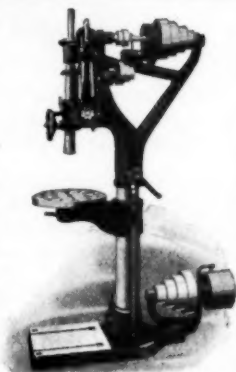
**Adaptable over a
Wide Range of Work**

Their exceptionally wide range of speeds and feeds enable the "Hoosiers" to cover a wide range of work.

They are unusually heavy, strong and rigid, the net weight being 100 to 150 pounds higher than that of the ordinary 20" drill. They have a stationary head, back gear, power feed and automatic stop. In every detail of construction we have endeavored to make "Hoosier" tools "of the first water."

Glad to send specifications

Hoosier Drilling Machine Co., Goshen, Ind.



Edlund Quick Change Sensitive Drilling Machine

With One to Six Spindles



A Few Features:

S K F Ball Bearings throughout. Ten ball bearings on each spindle.

Great rigidity is assured by using a one-piece casting for the upper frame, with all bearing surfaces extra large.

Unusual power results from the large diameter of drive and cone pulleys.

Spindle speeds of 510, 816, 1273 and 2038 r.p.m. — simply shift a handle a partial turn to change them.

A straight endless belt eliminates the objectionable quarter turn. Belt may be shifted from either side of machine.

This is only a small part of the story. Our illustrated folder describes fully the many advantages of this popular machine.

We have a copy for you; will you send for it?

Edlund Machinery Company, Inc.
250 Huntington Ave., Cortland, N. Y., U. S. A.

HAWES Radial Drill



We manufacture both wheel and belt polishing machines; Semi - Automatic polishing and grinding machines; Emery grinders, 10 in. to 10 ft. center to center of wheels; Gang Drills.

We manufacture machines in both belt and motor driven type.

Write for Bulletin No. 10

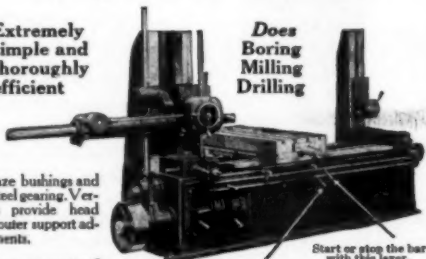
C. L. HAWES, Ashtabula, Ohio, U. S. A.

The LAMBERT Horizontal

For Big, Accurate Production

**Extremely
simple and
thoroughly
efficient**

**Does
Boring
Milling
Drilling**



Bronze bushings and all-steel gearing. Verniers provide head and outer support adjustments.

An economy tool

Start, stop or reverse any feed with this lever

Start or stop the bar with this lever.

**The Lambert Machine & Engineering Company
Cleveland, Ohio, U. S. A.**

Drills of Proven Value

Canedy-Otto 20" Power Drills



"Canedy-Otto's" are thoroughly modern, high-grade tools. They are smooth running and easily manipulated, as well as very rugged and rigid in construction without being clumsy. They are simple in design, and have all the graduated and automatic features of high-priced drills. They drill up to $1\frac{1}{2}$ " with perfect accuracy. The large bearings are made of the best babbitt metal, with hydraulically pressed graphite cones, which increase the life of the bearings 300 to 400%. For belt or motor drive.

The price is right, too. Write for complete data

Canedy-Otto Mfg. Company
Chicago Heights, Ill.

Manufacturers of Forges, Blowers, Drills, Lathes and Grinders

"Minster" Jr. Drill

Can Be Used On a Wide Range of Work

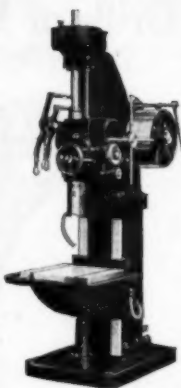
This drill has 6 speed and 4 feed changes, but any desired speeds and feeds may be obtained by changing gears. *This feature allows its being used on a wide range of work.* It has power and strength for heavy boring as well as light drilling. There are few parts running idle, and hence the amount of power needed for operation is greatly reduced.

Bulletin No. 30 describes it fully

MACHINE TOOL DEPT.

Minster Machine Co.

Minster, Ohio



Three Machines In One

The "Demco" No. 40

Drilling, milling and tapping machine makes a most valuable addition to the labor saving machinery in any shop. It is especially adapted to and is very useful for the making of jigs, dies, tools, etc., where accuracy is absolutely necessary.

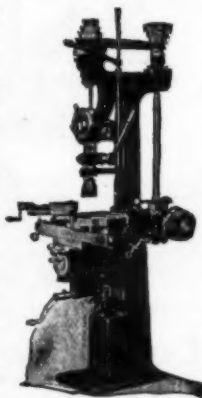
There is a very obvious advantage in a single machine which performs all the operations which the "Demco" No. 40 does. It has a reverse drilling capacity of $\frac{3}{8}$ " and tapping capacity of $\frac{3}{8}$ ". Has four back-gear speeds, right or left, and both positive and sensitive feed.

Write us today for Circulars

The Demco Machine Tool Co.

706 Frankfort St., N.W. Cleveland, O.

Dale Brewster Mch. Co., New York, Chicago
E. A. Kinsey Co., Indianapolis, Ind.
Badger-Peckard Mch. Co., Milwaukee, Wis.
Monarch Machinery Co., Philadelphia, Pa.
Wm. C. Johnson & Sons Mch. Co., St. Louis
W. M. Pattison Supply Co., Detroit
Berger & Carter Co., Los Angeles and San Francisco, Cal.
The Walraven Co., Atlanta, Ga.



Automatic Accurate Action

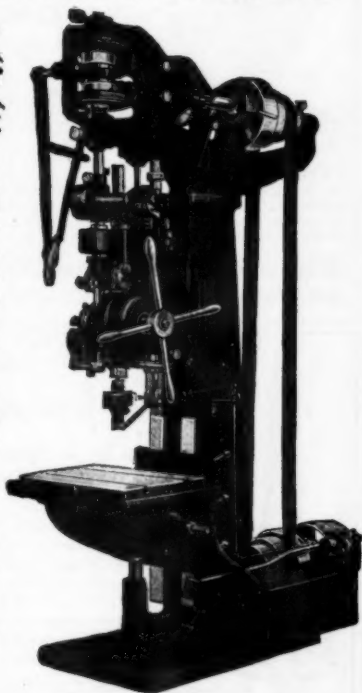
It will pay you to know about the various operations which this versatile machine performs at a remarkable saving in time and cost. It completes a series of operations with just one setting of the work.

The rotation of the

Turner Turret

is automatic. When the operator returns the spindle to its full height, it automatically indexes to the next spindle. The automatic feature is not complicated; machine can be operated at full capacity and will produce accurate results in the hands of any average operator. There's an extremely wide range of speeds by means of minor gear changes.

Full data in Bulletin FH. The Quint Turret is described in Bulletin QH.



TURNER TURRET

Turner Machine Company
DANBURY, CONN. and Newark, N. J.
Incorporated with Turner, Atherton & Co., Ltd.,
Denton, Manchester and Stockport, England

The Most Efficient Bench Tapping Machine



Bicknell-Thomas
Friction Driven

Sizes
0 to 1/4"

EXTREMELY SENSITIVE: Operated by cone friction mechanism, the drive is automatically adjusted by the pressure of operator on spindle, eliminating all sudden strains, saving taps and time and increasing output. It is simple, durable, compact. Just set it on bench, put plug in nearest electric socket, and it's ready. *May we describe and quote?*

Bicknell-Thomas Company
90 Wells Street, Greenfield, Mass.

Woodstock Improved No-Tap-Breakage Chuck

Releases Tap the Minute it
Binds or Strikes Bottom



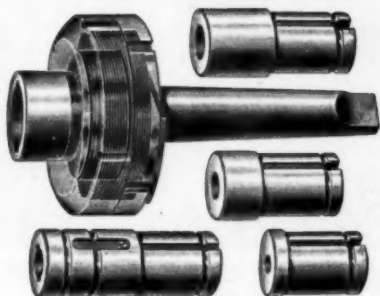
This chuck enables you to get about 99 per cent of the strength of the tap without breaking it. It saves not only taps but also time and material. On one job you may save the cost of this chuck. On difficult jobs such as blind tapping and bottom tapping in shallow holes, the "Woodstock" is indispensable. It positively eliminates tap breakage.

Used by U. S. Armies. Write for full details

Peter Bros. Mfg. Co. 115 Railroad St.,
ALCONQUIN, ILL.

The Simplest, Most Satisfactory
Drill And Tap Holder

**Taps to Bottom in Safety
Saves Time and Taps**



**The "Safety"—Friction Driven
Made in Four Sizes, 0 to 2½" Diameter**

No drill and tap holder is simpler, none is more efficient, none is safer, and none is giving greater universal satisfaction. It is convenient, accurate and rapid, with nothing to break or get out of order.

The "Safety" power driven holder permits tapping to bottom at full speed, for it stops before the tap will break, while spindle revolves. Change is made from drill to tap, or tap to drill, without stopping spindle.

Try it out on your most difficult work

The Beaman & Smith Co.
Providence, Rhode Island
Manufacturers of Boring and Milling Machines

DO You Use AIR?

**THE POWELL
AIR GUN VALVE**

JUST PRESS
THE BUTTON

BUY
POWELL
AIR GUNS
KEEP
CLEAN

CLEANS
WORK BENCHES
AND
MACHINE TOOLS
MADE IN SIZES
1/8" TO 1"

ORDER A SAMPLE
THE W. M. POWELL CO.
1200 DRAPER ST.
CINCINNATI, O.



Men Will Do More Work With Better Equipment

A Ritchie-Wertz Modern Bench

will produce results just as surely as any other high class tool, because it helps the man to use his time and effort to the best advantage. It provides a convenient place for his blueprints, tools, stock, etc., a bench of just the right height, and a 5" guard around three sides of the top. Let us refer you to up-to-date manufacturers who are using it. A line will bring complete information.



THE RITCHIE-WERTZ CO., Dayton, Ohio

Hammond High-Speed Sensitive Radial Drills

Minutes—even seconds count when you are doing light drilling and tapping. If your mechanics spend their time moving heavy parts each time they drill or tap a hole, they are cutting your production and profits.

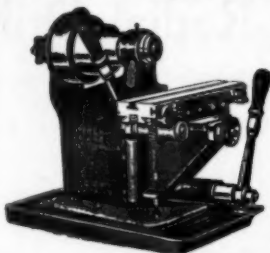
With a "Hammond" they move the tool from place to place instantly—anywhere within a 48" circle. They move the tool and not the work. The operator's time is spent in production—not in doing laborer's work at mechanic's wages.



*Write and find out how you
can cut your light drilling
and tapping costs 25 to 33%*

The Hammond Mfg. Co.
Cleveland, Ohio

Just The Machine



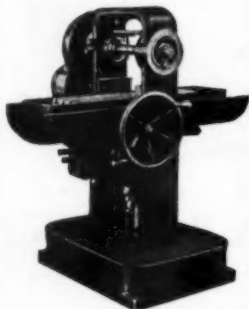
for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

A Better, More Economical Miller

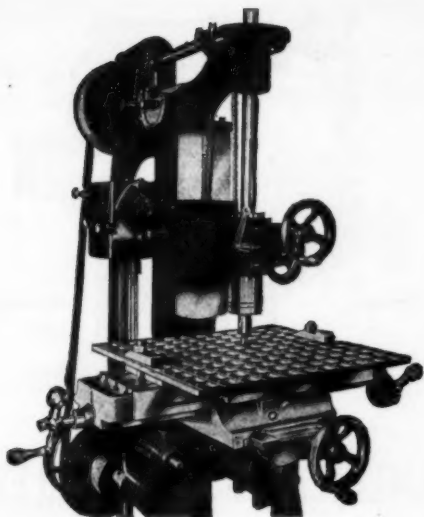


Briggs High Duty

A milling machine designed by a manufacturing engineer who for years had felt the need of such a miller. For heavy and rapid cuts in manufacturing, it is better and more economical than any machine previously on the market. All unnecessary complications and their attendant weaknesses have been eliminated. Those features most essential to rapid and accurate production in a miller—*rigidity, power and convenience of operation* are the ones in which the Briggs excels all others.

Write for description of this exceptional cost reducer

GOOLEY & EDLUND, Inc., Cortland, N. Y.



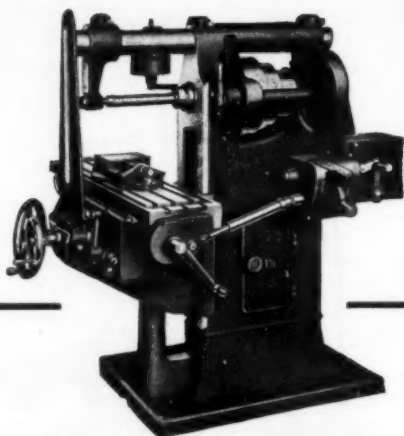
Machining Moulds On a Knight

You will find all four sizes of the Knight Milling and Drilling Machine adapted for all kinds of difficult work, including the machining of intricate moulds, as shown in cut.

This particular job looked like a poser to the whole shop force until it was put on a Knight—and then it was easy. You will find Knights are standard machines to produce on a quantity basis, and the right tools for exceptionally hard machining stunts. Let us send you full information.

W. B. Knight Machinery Co.

3920 W. Pine St., St. Louis, Mo.



AMERICAN No. 1½ PLAIN **MILLER** BACK GEARED

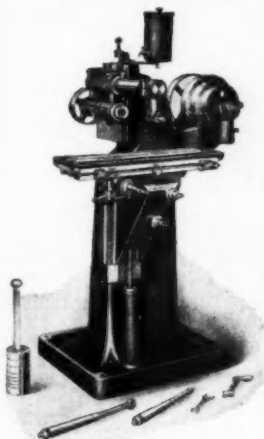
**Is Sturdy, Rigid and Accurate
A Dependable Manufacturing Tool**

This thoroughly modern milling machine is simple in design, quick and convenient in operation, and accurate in results. Its plentiful supply of metal is properly distributed to take care of all strains, the bearings are wide, all alignments are accurate, the adjustments are simple, and the oiling system insures ample lubrication. Furnished with Vertical Spindle Milling Attachment if desired.

Write for description of this up-to-date tool

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.

Hand and Weight Feed
U. S. No. 1 Hand Miller
For Greater Economy on Small Work



Features:

Wide range.
Quick adaptability.
Great power for its size.

Results:

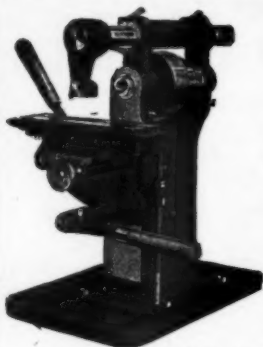
More economical milling of an unusual variety of small parts than can be done on big, expensive milling machines.

The vertical and horizontal feeds are independent and permit work being held close to table, so that it may be used as a profiler. The vertical lever feed being independent from table and the head accurately counterbalanced, light milling can be done on long or heavy pieces without danger of breaking cutters. The descriptive circular shows many other important features.

Furnished, if desired, with Universal Milling Attachment, or with Plain Milling Attachment, or arranged for motor drive.

We invite the most careful investigation

The United States Machine Tool Co.
Cincinnati, Ohio, U. S. A.



Burke's No. 3 Bench Millers

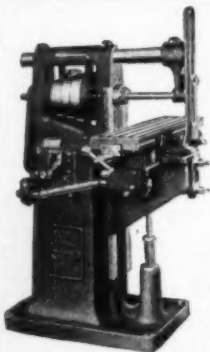
Are Seasoned Tools

Our system of tests insures accuracy, and our methods of construction make it permanent. Frames and parts are carried 6 to 8 months, after work begins on them, before the completed tools receive our final O. K., and all parts are finished and fitted with exceptional care.

Longitudinal feed, 6 in.;
traverse feed, $3\frac{1}{4}$ in.; vertical
motion of knee, 8 $\frac{1}{2}$ in.; table
surface, $3\frac{1}{2}$ x 12 inch.

Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
Conneaut, Ohio



A Miller of Great Accuracy

For a milling machine that's rigid, accurate, handy and powerful, there is nothing superior to the—

Davenport No. 2-B

The original construction of arbor support insures long life without wear, prevents chatter and makes possible the finest accuracy on parts requiring exact spacing and thickness. Quick change gear box provides 12 speeds.

Write for specifications, showing the unusual design in detail

THE DAVENPORT MFG. CO., Meadville, Pa.



**Has Each
Of Your
Employees
His Own
Locker
In Your
Plant?**

Terrell's Sanitary Steel Lockers

The installation of a group of Terrell's Steel Lockers—if possible, one locker for each man or woman in your employ—will be a great aid to contentment among your employees. You increase both their loyalty and their self-respect if you provide each with a locker which he knows is safe from meddlers and thieves as well as from vermin.

"Terrells" are absolutely safe and sanitary. Made in a variety of styles and sizes, either single or double tier, they adapt themselves to available spaces and meet any special conditions at moderate cost.

Glad to figure on your needs with no obligation to you

Terrell's Equipment Company

Hall & Division Sts.,

Grand Rapids, Mich.

Also ask about Terrell's Steel Bins and Shelving

Snap Gauges Superseded

Our Universal Amplifying Gauge enables you to dispense with 75% of your snap gauges

When the Universal is set, the parts can be gauged as fast as the workman can handle them. The saving is obvious.

You can adjust it in a few minutes for any size piece up to $5\frac{1}{2}$ " on the plate, and 8" between centers.

Used by U. S. Government; is especially valuable where Swedish gauge system is used.

Catalog No. 100 explains fully



THE NORTH SIDE TOOL CO., Dayton, Ohio
Manufacturers of Special Tools, Dies, Jigs and Fixtures



Straight Shank Turning Tool



Boring Tool



Straight Shank Cut-off Tool

Armstrong Tool Holders

Make One Pound of High Speed Steel go as far as Ten Pounds in Forged Tools.

Grand Prize Winners at Panama-Pacific Exposition.

Complete Catalog Free.



Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.

The American Amplifying Gauge

For the accurate and economical gauging
of Flat and Cylindrical Work without the
use of Fixed Gauges or Micrometers



Checked and adjusted quickly and
easily by unskilled operators

Snap gauges represent a heavy expenditure. If they are of the fixed type, they wear rapidly and must be replaced frequently. If of the adjustable type, their proper adjustment requires considerable skill. In any event, constant and expert checking is always necessary, and even this does not always prevent disputes between inspectors and operators.

The American Amplifying Gauge supplies a perfect and economical remedy. It is a permanent tool, but very sensitive. Used in connection with master gauges or models, each gauge is held in constant check by the user—no special skill required.

American Gauges are being used successfully in big automobile plants for measuring pistons and piston rings, the thickness of piston rings, valve stems, and similar parts.

*May we explain to you the great convenience and
economy of the American Gauge and the Limit System?*

American Gauge Company
Dayton, Ohio

Foreign Agents: Alfred Herbert, Ltd., London, England

Time Saved

By using

The National Keyseating Miller

*For Full Particulars
Write for Catalog O*

National Machine Tool Co.

2266 Spring Grove Ave.,

Cincinnati, O.



Anderson Sensitive Balancing Ways

Always Ready—Require No Adjusting



These balancing ways are very sensitive and are always ready for work without having to be adjusted. They have no superior for balancing anything that turns on a shaft: e. g., cutter heads, crank shafts, aeroplane motors, propellers, polishing wheels, cones, pulleys, gin brushes, armatures, rotors for turbines, etc., etc.

Rotation discs are made of chilled iron, ground true on face and perfectly balanced. Five sizes of these balancing ways, for parts up to 10,000 lbs., cover all requirements.

Their reliability commends them. Send for details

Anderson Bros. Mfg. Co.

115 Morgan St., Rockford, Ill.

Modern Methods for Quick Work



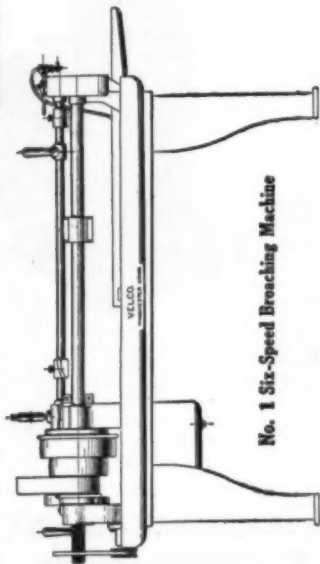
A DAVIS KEYSEATER

Motor driven,
will save you
valuable space
as well as in-
crease your pro-
duction. It is
an investment
you can't afford
to overlook.

Write for Circular

DAVIS MACHINE TOOL CO., Inc.
ROCHESTER, N. Y., U. S. A.

The Fastest and Best Way to do KEYWAYS or BROACHING is



No. 1 Six-Speed Broaching Machine

The
VELCO
Way

THE V. E. LA POINTE MFG. CO., Hilliard St., MANCHESTER, CONN.

**Drives by
the square.**

**Centers by
the shank.**



Woodruff Keyway Cutters

With Squared Shank

For use in connection with the "Wear-Ever" Woodruff Keyway Chuck, shown at the left, which *drives by the square and centers by the shank*. This insures a positive drive and true-running cutter at all times, and eliminates the making of collet chucks. There is no additional charge for the squared shank on these Cutters, which are manufactured by us.

The "Wear-Ever"

Woodruff Keyway Chuck

Is made in one piece, hardened and ground. There are no screws to adjust and no parts to become lost in the shop. It fits all spindles of the standard makes of milling machines, and is made in all tapers, such as Brown & Sharpe and Jarno tapers.

The efficiency, accuracy, convenience and economy of "Wear-Ever" Woodruff Keyway Chucks and our Squared-Shank Cutters will so appeal to you and your workmen that if you use them once you will never willingly be without them.

How about a trial order?

Scully-Jones & Company

Suite 555 Railway Exchange Bldg.,

Chicago, Ill.

Draw-in and Thrust Chucks

for Tool Room Lathes and Screw Machines. Look for the name "Hardinge Brothers" and write us. And did you ever ask us to make those—

Screw Machine Collets

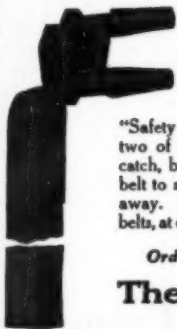
with regular or irregular holes? We are prepared to make good deliveries. Why not try us next time? Quantities never too small or too large to interest us.

When making inquiry, kindly refer to "Chuck Department"

Hardinge Brothers, Inc.
Chicago, Ill.

The Prevention of ONE Accident

Will Well Repay You for Installing "Safety First" Belt Sticks



Perhaps you have never had a belt shifting accident, but you never know when one will occur. If these sticks prevent only ONE accident, they will earn their cost many times over.

"Safety First" Belt Sticks have three rollers, two of which are tapered. They CAN'T catch, because the tendency is always for the belt to slide onto the pulley as the shifter slides away. Two sizes, for 1" to 4" and 4" to 6" belts, at one price, only \$1.50 each or \$15 a doz.

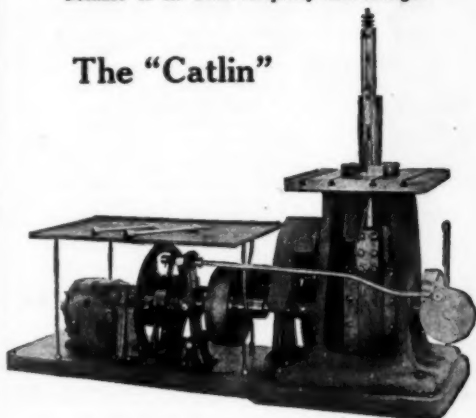
Order a few now and "be prepared"

The Ready Tool Co.
Bridgeport, Conn.

A Glutton For Keyseating

Because of Its Great Simplicity and Strength

The "Catlin"

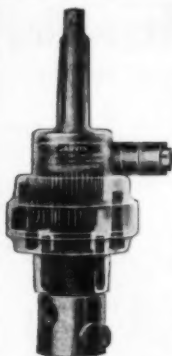


THE DESIGN of the "Catlin" is so simple that it has less than half the number of parts of other makes. We are thus enabled to build it stronger and better throughout. In regard to speed, this machine in ordinary shop practice, when there was no attempt to establish a record, cut the following: in 20 minutes, keyseats $2\frac{1}{2}$ " long, $\frac{1}{2}$ " wide and $\frac{1}{4}$ " deep, in 20 mitre gears of 8" diameter; in 3 minutes, a keyseat 6" long, 1" wide and 7-16" deep, in a cast-steel hub.

Whether you desire one keyseat or a thousand, the "Catlin" will cut them accurate to even better than 1000's of an inch. It is built in sizes suitable for all classes of work. Furnished for belt or for direct connected motor drive.

Better get our interesting, large, illustrated folder

Chattanooga Machinery Company
Chattanooga, Tenn.



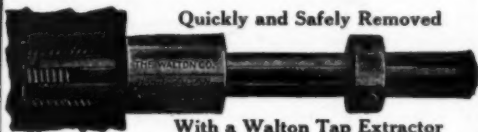
The Ball Drive and Ball Reverse

make the Jarvis Tapping Device a little better than anything yet discovered for driving taps. It never clinches, binds or stops rolling when it starts, and it is so easy in action that it eliminates not only broken taps, but all the other troubles that the operation of tapping develops. The gears are for the reverse motion of the chuck—not for driving. They back the tap out almost instantly.

You won't regret asking for a folder.

**THE CHARLES L. JARVIS COMPANY
GILDERSLEEVE, CONN.**

Use Taps With More Freedom Any Taps You Break Can Be



Quickly and Safely Removed

With a Walton Tap Extractor

You can use taps with more freedom if you know that you have within reach a Walton Tap Extractor. It is a handy, inexpensive tool for quickly and easily removing taps broken at or below the surface of the work, without injuring the threads. Sizes from No. 8 to 1¼" tap.

Folder, or trial, or both, on request

THE WALTON CO., Hartford, Conn.

Money Earner

Greater Output

Replaces Hundreds of Solid Tools

Money Saver

Lower Costs



The Genesee Adjustable Hollow Mill

A money earner. It maintains on steel a cutting speed of 12" to 15" per minute, and is a general increaser of production. Designed to utilize machines to their full capacity. Can be adjusted in a few minutes to 1000's of an inch.

A money saver. It differs from solid tools in several important respects: it cannot clog nor change size; only 14 sizes cover the entire range from $\frac{1}{4}$ " to 2", replacing hundreds of solid tools; one set of blades will outlast 3 to 5 solid tools.

*What more can you ask? Why not put your jobs
up to our engineers for rapid production?*

Genesee Manufacturing Co., Inc.
Rochester, N. Y.

Manufacturers of Adjustable Hollow Mills, Facing Tools, and
Inserted Tooth Face and Side Milling Cutters

Madison Cutters Displace Reamers



Madison Adjustable Boring Cutters and Bars

Are made in 45 sizes for use in automatic machines, turret lathes, boring mills, etc. They can be sharpened and set to within .00025" in less than five minutes. They take the place of reamers and do much better work, insuring absolutely straight holes, from $\frac{1}{4}$ " to 5" diameter.

Used on U. S. Government work. Full details on request

MADISON MANUFACTURING CO., - Muskegon, Mich.
Tool Agents Wanted

A Most Valuable Addition To Your Tool Room Equipment



**Saves time,
material
and
mistakes**

Flynn Combination Drill and Micrometer Boring Head No. 10

A **good** tool for use on milling and horizontal boring machines. Dial is graduated in 1000's of an inch to allow accurate off-set boring on jigs, fixtures and experimental work. Head runs concentric and has no projections to interfere in reaching small places. Boring bar is $\frac{3}{4}$ x5". Limit of drills, 0 to $\frac{1}{4}$ ".

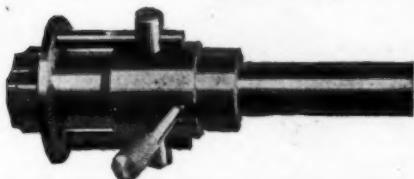
You'll not forget to write if you call your stenographer NOW

J. M. WATERSTON, 78 Woodward Ave.
DETROIT, MICH.

Murchey Service

Adds to the Known Economy of

Murchey Tools



MURCHEY THREADING TOOLS—Solid Adjustable Taps, Automatic Collapsing Taps and Automatic Opening Die Heads—are unsurpassed in their ability to do all threading work efficiently, quickly and economically. But threading tools are of no use without chasers, and "Murchey Service" means prompt deliveries. Murchey Tools do not have to lie idle because you cannot get chasers when you want them. This combination of economy tools with prompt service at all times *means time and money saved for you.*



Nor do you have to take our word for the excellence of Murchey Threading Tools. You can try them out on your own work in your own shop at our risk.

Send us blue prints of your work today, and we will ship you the tool best suited to handle it. You need not pay us a cent if it is not satisfactory.

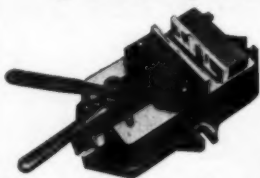
Just give Murchey Tools a chance, and they'll make good

Murchey Machine & Tool Co.

58 Porter St., Detroit, Mich.

Colt Milling Vise, Armory Model

Quick-Acting—Sturdy—Reliable



Width of jaw.....5 in.
Depth of jaw.....1 1/4"
Weight.....40 lbs.
Maximum opening with
false jaws removed...3 1/2"

A large manufacturer of fire-arms needed, during the war, a better milling vise than he could buy. Consequently, he developed and built this milling vise which we are now putting on the market.

It is very rapid in operation, and is very sturdy—it had to be to turn out the large quantities of accurate work which were demanded of it. It will outwear an ordinary vise five times. Shop tests carried out under actual working conditions show that this vise gives unusually long service. It is built for service and is thoroughly reliable.

It will pay you to learn the particulars. And the price is O. K.

The Hartford Special Machinery Co.
285 Homestead Ave., Hartford, Conn.



Davie Gauging Machine.
Graduations in .0001
Height 17" — Length 15" — Width 9"

BURTON, GRIFFITHS & CO., Ltd.
Ludgate Sq., Ludgate Hill, London, E.C.
Agents for Great Britain
SOC. ANONIMA ITALIANA ALFRED HERBERT, Milan, Italy. Agents for Italy

**For inspection work where
limits are close and accuracy
and speed essential**

1. Measuring Plug Gauges in readings of .0001
2. Measuring Interchangeable Parts in readings of .0001
3. Measuring Drill Jig Bushings in readings of .0001
4. Measuring Pistons in readings of .0001
5. Measuring Ball or Roller Bearings in readings of .0001
6. Testing Concentricity of Form Milling Cutters .0001
7. Testing Concentricity of Spindles of various designs .0001
8. Settling Shop Disputes over Micrometer Readings
9. Speeding up Production Gauging

Any attachments to suit your needs
The Davie is Standard Throughout America and Europe

22 in use in The Ford Motor Plant Alone

Send for catalog

The Davie Tool Co.
E. 118th & Euclid Ave., Cleveland, O.

SOC. ANONYME ALFRED HERBERT
47 Boulevard de Magenta, Paris
Agents for France
Agents for Italy

Why Waste Time on Resetting?

The Universal Angle Plate Enables You to Machine Parts at Any Angle Without Resetting the Work



Protected
By Patents

Made in Four Sizes 8"x10" Worm Adjusting

This modern, up-to-date machine shop accessory can be used on any type of machine tool. In the repair shop it is simply invaluable, as it practically transforms a plain grinding or milling machine into a universal tool.

You are enabled to grind tapers, whether round or flat, and angles are accurately milled, planed or shaped on any piece. It is the most convenient device for the die sinker that has been brought out in years. It is reliable for the most accurate work.

Avail yourself of this time and money saving device. Full particulars and price upon request

Boston Scale & Machine Company
100 Ruggles St., Roxbury, Mass.

Rapid Operating
Carroll Drill Press Vise
For Convenience and Production



**Dimensions
of No. 5**

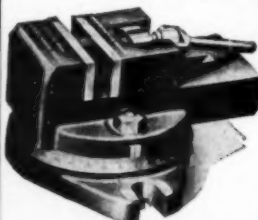
Width of vise 5"
 Vise opens 6"
 Width of jaws 5"
 Depth of jaws 1 1/4"
 Opening thru
 center of base 1 1/2"

Three seconds is all the time required to shove sliding jaw up to the work and to give a turn to the clamping screw. **Guaranteed to be true in any of the three positions in which it is placed.** Especially adapted to drill press work. Three sizes—3 1/2, 5 & 7".

The vise you need. Let us tell you about it.

Cincinnati Vise Company
 Station H., Cincinnati, Ohio, U. S. A.

**CAN BE OPENED, CLOSED AND CLAMPED
IN AS MANY SECONDS**



This cat-quick vise with a grip like a bulldog is easily the best vise buy on the market today.

Precision-built and with extra capacity the

**Nestor
Vise**

stands supreme. Let us tell about the special, quick-sliding jaw in detail. Also made with square, flanged bottom, sides and ends.

The Vise With Virtue

Nestor Quick-Acting Drilling and Milling Vise. Four sizes, 2 1/2, 4, 6 and 9 inches.

Immediate shipment

We have exceptional facilities for light manufacturing, jig, die, fixture, gauge and punch work. Let us know your requirements for quotations.

*Write TODAY for
description and prices*

Nestor Mfg. Co., Inc.
 40 W. 13th St., New York City



WHY YOST VISES?

Because the best vise judges, the men who use vises in machine shops all over the world, have given them unqualified approval.

Because they are designed and proportioned to give the user the greatest possible convenience, combined with strength to withstand usual and unusual stresses, and a dependable reliability that is a guaranty of service.

Because they are manufactured in a thoroughly modern plant, with all needed facilities, and by men who are trained for this special work.

*Let us send our catalogue, and suggest
the best vise for your particular work*

Yost Manufacturing Co.
Meadville, Pa.



Quickgrip Table Vise Fits Any Drill Press



Simply remove drill press table, and the "Quickgrip" fits into the socket and swivels same as regular table. When open it furnishes a drill press table 16"x24". Clamps work quickly and securely, saving time, drills and material, and insures accurate work. Allows work to run below table to base of drill press. Interchangeable steel jaws.

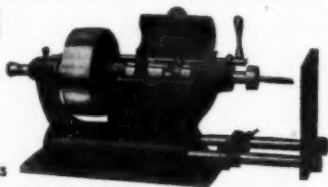
Write for full description of this handy helper

Sprague-Hayes Manufacturing Co.

44 E. Larned Street,

Detroit, Mich.

Workwell Tapping Machine



**Built for Service
Has Many Fine Points**

2 bar slide to hold work straight with tap.

Steel gears 2" diameter, enclosed and running in oil.

Extra large hardened clutch. One loose pulley with hardened clutch. Non-slip tap holders. Die holder for threading outside threads. Stop adjustment for any depth of thread.

MADE IN TWO SIZES.

Type B 2 for threads to $\frac{1}{4}$ " diameter Type C 2 for threads to $\frac{1}{2}$ " diameter

Give it a trial. Manufactured by

Workwell Engineering & Mfg. Co.

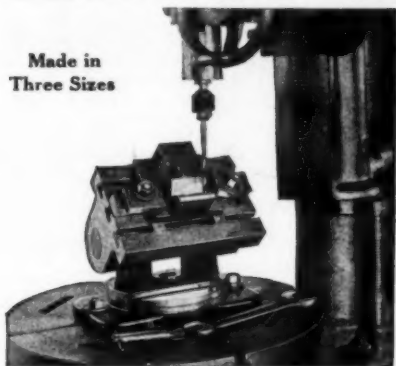
Dept. 2

616-620 W. Monroe St., Chicago, Ill.

Make Set-Ups In Quick Time

A Reid Universal Angle Fixture enables the most ordinary operator to do reliable, accurate work in record time

Made in
Three Sizes



IT IS WELL WORTH WHILE, from a strictly dollar-and-cents point of view, to give a mediocre mechanic the facility of an expert for handling difficult set-ups. It helps him to drill, mill, plane, shape and grind accurately—saving time, material and temper. Of especial value for die sinking, tool and experimental work.

The double vernier gives you the setting instantly within 1-12th of a degree, and an even finer adjustment with a sine bar. It swivels 360 degrees horizontally and 180 degrees vertically. The design eliminates all overhang.

You need this economy device—why not order now?

Reid Bros. Co. 59 Park St.
Beverly, Mass.

Export Department, 77 Broad St., New York City

English Agents, Oliver Machinery Co., Ltd., 201-03 Deansgate, Manchester, Eng.

Also Manufacturers of the Reid Surface Grinder

For Drilling In Hard-To-Get-At Places



The Harris Offset Drilling Attachment

Is furnished in sizes for every drill press. Made in standard forms, or modified for your requirements. It is highly practical, thoroughly tested by automobile, truck, tractor and aeroplane manufacturers, and does efficient work where nothing else will reach at all.

Write for the Folder O. K.

The H. E. Harris Engineering Co.
Bridgeport, Connecticut

The Alert Boring And Facing Tool



High Speed Steel Blades

Made in Three Sizes

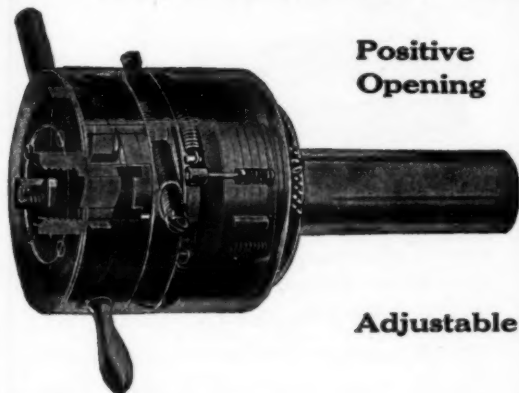
FOR USE on turret lathes, automatic screw machines and drill presses, for facing, counterboring and radiusing where a fine finish is desired, and for boring large holes where the cost of high-speed drills is prohibitive. It has bored very accurate holes with a good finish up to six inches deep.

WE ALSO MAKE Ratchet Tap Wrenches, Roller Grip Arbors and Roller Grip Mandrels—all patented; High-Speed Solid Tap Wrenches and Hand Knurling Tool Holders.

Write for descriptive circular "H"

Alert Tool Co., 237 N. 6th St.
Philadelphia, Pa.

You will be pleased with the greater production a "Boehm" makes possible



**Positive
Opening**

Adjustable

We ask you to note—

That the Boehm Automatic Die Head has a universal taper attachment cam, adjustable for any taper or length of thread, which is especially useful where a variety of threads is required.

That spoiled work is practically eliminated in shops where "Boehms" are used. There are no stripped threads or broken chasers to delay the work or to contribute to that expensive scrap heap.

Positive opening and closing cam action prevents chasers from sticking. The 21 sizes increase production, improve the quality and lower costs.

Why do without? Glad to send one on trial

RICKERT-SHAVER CO., 1110 CHERRY ST., ERIE, PA.

For Use On Drills and Millers Hoosier Vises



Three
Sizes:
3¼, 4½,
7"

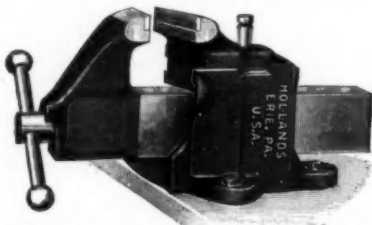
"Hoosiers" are also equally adaptable to planers and shapers. They are *accurately machined* and made of the best materials obtainable. The jaws are faced with hardened steel, unless otherwise specified.

Flanges with bolt slots are provided on the body of the vise to enable the operator to anchor securely the vise to the table of the machine. A milled key slot running the entire length of the bottom of the vise allows perfect alignment on milling machine tables.

Call your stenographer now and write for details

Hoosier Drilling Machine Co., Goshen, Ind.

For 32 Years HOLLANDS Have Been Vises of Outstanding Superiority



Absolutely rigid, and guaranteed not to lose correct alignment. It matters not for what purpose you want a vise—we have the one you need. *Write for Catalog of "Holland's Vises."*

HOLLANDS MFG. CO.,
Established 1887

Erie, Pa.



McCrosky Super Reamers

**FIRST
RATE**—

said the "Super" in the Locomotive Stoker Company's plant at Pittsburgh, Pa. We've been using "McCrosky" Super Reamers for a LONG TIME—in fact, all our Reamers are McCrosky.

One of our 4" Reamers removes .0050" stock from a 3½" deep hole in malleable iron. It does this at least 200 times between grindings, proving beyond question that "McCrosky Cost Cutting Tools" means just what it says.

*Read all about Super Reamers in
McCrosky Efficiency Book No. 6*

McCrosky Tool Corporation
Meadville, Pa., U. S. A.

Detroit: Kresge Bldg., C. M. Sutton, Manager
Export Manager, B. Whittaker, 21 State St., New York

Star Vises

THAT efficient service over a long period is a recognized characteristic of Star Vises is shown by the steadily growing list of manufacturers who are adopting Star Vises as standard equipment.



Universal Swivel Toolmakers' Vise
Warranted

"Star"



Standard Machinists' Bench Vise
Warranted

Made in all Standard
Sizes and Types

Write for illustrated catalog

Fulton Machine & Vise Co.
Lowville, N. Y.

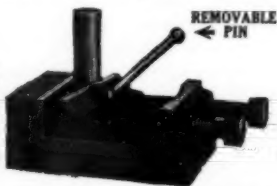
SOLE SALES AGENTS

Boker Cutlery &
Hardware Co.

101 Duane St., New York, N. Y.

"AUSTIN" HANDY VISE

5 SIDES
SQUARED,
HARDENED
JAWS
2 in. Wide
 $\frac{1}{2}$ in. Deep



REMOVABLE
← PIN

SWIVELED
and "V"
JAWS
for Holding
Taper and
Round Pieces

A strong, compact and self-contained tool for the tool room. Price only \$4.75 delivered anywhere in the U. S. A.

Write for further description
Liberal Terms to Jobbers on request

Austin Tool & Machine Co., Inc.
915 N. Murtland Ave., Pittsburgh, Pa., U. S. A.

The Cashman **Adjustable Shell Reamer**

**Stands Hardest Use—Increases Output
It Outlasts 15 or 20 Solid Reamers
Cannot Change its Size in the Hole**



The Simple Parts of the Cashman Reamer

It has *only three parts*, in addition to the blades, which makes it compact and sturdy. *All parts are interchangeable.*

Blades are of high speed steel unless otherwise ordered. The lip on the blade, as shown in illustration, insures great rigidity. The blades are made heavy, and can be *renewed and used their entire length of adjustment.*

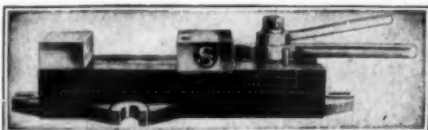
A trial *at our risk, in your own shop*, will demonstrate its great simplicity, durability, efficiency and economy. If its keen cutting qualities and ability to reduce costs do not appeal to you in actual operation, you may return at our expense.

We are ready for the trial; are you?

Cashman Tool Company
Waynesboro, Pa.

"Supreme" Quick Action Cam Vise

Draws the Work DOWN Instead of Up



Patented May 8, 1919

The work is gripped very securely and is *drawn down* in the vise instead of being raised up, as it is in screw vises.

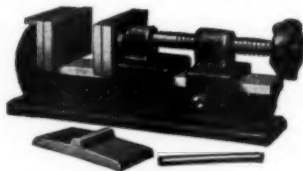
The "Spafford" is especially quick-acting. And when once the levers are tightened in position, they give a wedging effect so that it is impossible to force them back by clamping the work. The vise has no parts to get out of order, even though considerably abused. *A better vise cannot be found.*

Write for literature describing its "10 Superior Features."

SPAFFORD TOOL WORKS, - Hartford, Conn.

Export Department, 77 Broad St., New York City

Gem Drill Vise



Strong and Durable

Quick in Action

Powerful Grip

Made by

J. E. Martin Tool & Die Co.

548 West State Street,

Springfield, Ohio

Thousands Of
WEAVER FORCING PRESSES



Are Serving
Garages
Electric Shops
Machine Shops
Factories
and
Many Other
Industries

Because of the
wide range of application, great depth adjustment, ease in handling bulky work, greater satisfaction in small work,

**Quick Release Feature and
the Enormous Leverage**

which enables the mechanic or workman to exert a maximum pressure of more than 20 tons without calling assistance.

*For complete description write for Catalog "E"
Net price East of Pacific Territory, \$85.00*

Special presses of extra width can be furnished at a nominal charge

Weaver Manufacturing Co.
2179 So. 9th Street. Springfield, Illinois

ELECTRIC EUCLID HOISTS

Let OUR Engineers Save YOUR Time

It is possible that you realize the need of modern material handling equipment but cannot spare the time or men to work out the details.

Our engineers are constantly solving these difficulties and helping manufacturers reduce expenses.

Furthermore, this service is absolutely free.

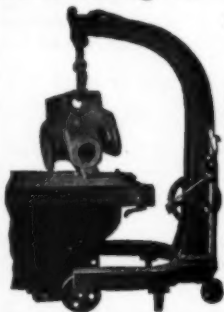
Will you take advantage of it?

The Euclid Crane & Hoist Co.

Dept. C

EUCLID, OHIO, U. S. A.

For Both Light and Heavy Weights—



**From 200 to 4000 Lbs.
Canton Portable
Crane and Hoist**

Enables one man to lift and lug any weights—from those just a little too heavy for hand lifting up to ones of 4000 lbs. This Crane well merits its title, *'The Handiest Tool in the Shop.'*

Even the factory elaborately furnished with overhead equipment needs this Hoist, because it acts as an auxiliary to the large equipment, relieving it of the smaller work and carrying work to parts of the shop not commanded by the larger hoists.

*Many sizes. Write
for Booklet E-8*

Canton Foundry & Machine Co.
Canton, Ohio

Permanent Exhibit Salesroom, Grand Central Palace, New York



Greenerd Arbor Presses In All Sizes



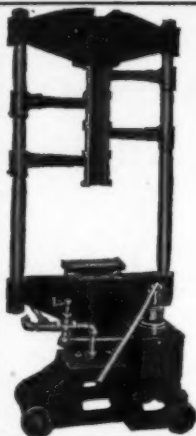
From
15 Lbs.
to
40 Tons
Pressure

MANUFACTURING PLANTS find them indispensable for economical quantity production—repair shops need them for handling the odd job expeditiously. They were up-to-date equipment before the war—essential equipment during the war—and increasingly necessary now to speed up production and help stabilize the industrial world.

They have no equal for driving arbors, crank pins or bushings; for broaching, punching, bending with dies, straightening auto axles, and for dozens of other jobs that come up daily in a modern machine shop.

Consult our Catalog for your 1920 needs

EDWIN E. BARTLETT, Nashua, N. H.



Portable Hydraulic Press

With Rapid Movement of Ram

20 to 60 tons capacity.
12° to 30° between uprights.

**A Very Useful and
Inexpensive Tool**

FOR

**The Garage or
Machine Shop**

We make presses for
special work.

Write for Catalog

Lourie Mfg. Co.
Springfield, Ill.

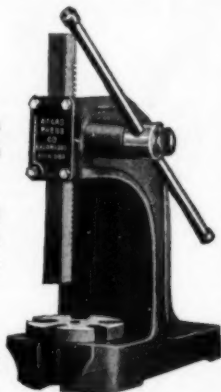
Atlas Presses

pay for themselves
quicker today than
ever before.

Built in all sizes for all
work which can be
practically accom-
plished by hand.

Atlas Press Co.

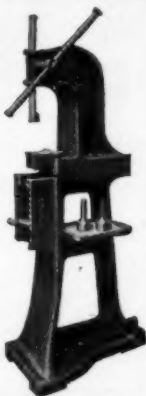
Kalamazoo, Mich., U. S. A.



You save money every time your workmen use a Nicholson Arbor Press

And you'll find that it has a lot of uses beside pressing out arbors. Think of the time it saves in such work as punching, bending and broaching. In addition it saves the bushings, shafts, pinions, arbors, etc., that otherwise would be battered by the impatient use of a sledge.

The Nicholson No. 3 Arbor Press is the size best adapted to the work in the general run of machine shops. It costs \$29.63. The time it will save your workmen will soon pay for it.



NICHOLSON Expanding Mandrels

are more time savers. With them the time your workmen now lose in caliper and turning down solid mandrels can be put to work that pays a profit.

A set of Nicholson Expanding Mandrels *instantly* fit any size hole from $\frac{1}{2}$ inch to 7 inches.

A post card brings our books on Arbor Presses and Mandrels. We will send Nicholson Arbor Presses and Expanding Mandrels on 30 days' trial.

W. H. Nicholson & Co.
117 Oregon St., Wilkes-Barre, Pa.

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BURTON, GRIFFITH & CO., Ltd.
Ludgate Square, London, E. C.

BURTON FILS
68 Rue des Marais
Paris, France

MONTI & OSCURO
Milano, Italy

ANDREWS-GEORGE CO.
16 Takagawa-cho, Kichashi-ku
Tokyo, Japan



CUSHMAN
CHUCKS
1862



Cushman Chucks Stand High
in the estimation of Mechanics
the World over



THE CUSHMAN CHUCK CO.

**HARTFORD,
CONN., U.S.A.**



The WICKES BLUE PRINT SYSTEM

—is today being
adopted by the
WORLD'S largest
industries.

WHY?

*Send us a re-
quest and we
will tell you*

Wickes Bros.

1802 Water St., Saginaw, Mich.
Builders of Heavy Machinery

Jacobs Chucks

The calibre of an organization can best be judged by the service of its merchandise. Users of Jacobs Chucks know that to manufacture them, there must be a cohesive, contented personnel. It shows in the product.

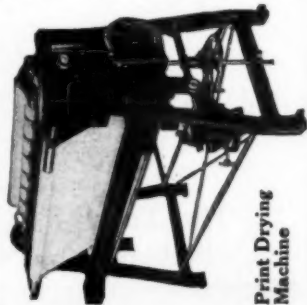


The Jacobs Mfg. Co.
Hartford ~ Connecticut.

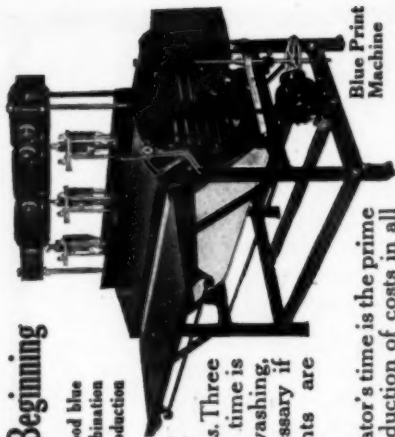
Cut Your Production Costs at the Very Beginning

Quick blue printing saves time in factory and office. Good blue printing lessens waste of material, as well as time. A combination of both means economy and will aid in speeding up production

Paragon Equipment will produce clear, sharp, permanent prints, dried and ironed, ready for use in *four minutes*. Three minutes of this time is allowed for washing, which is necessary if permanent prints are desired.



Print Drying
Machine



Blue Print
Machine

Saving the operator's time is the prime factor in the reduction of costs in all branches of industry. Paragon machines accomplish this for the Blue Printing Departments.

May we prove it? Ask for Catalogue "K".

PARAGON MACHINE COMPANY, ROCHESTER, N. Y.

The Barker Wrenchless Chuck

**Turns Wrenching and Adjusting
Time Into Actual Production Time**

KNOWING the class of work you are running, how long the cuts remain in the lathe, and how much time is required between cuts for stopping the lathe, unscrewing, adjusting and screwing up the old style chuck, you can figure right down to dollars and cents how much *The Barker Wrenchless Chuck* will increase your lathe production with its instantaneous operations.

*Sizes 6 to 16 inches. 2 and 3 jaws.
Send for Catalogue*

Thomas Elevator Co.

Chuck Division

31 S. Hoyne Ave., CHICAGO

TC-89



**Branch Office, 725 Park Row Bldg.
NEW YORK, N. Y.**

Are You Chucking For Profit?

Try Sweetland Lathe Chucks



ONE TRIAL will make you an enthusiastic user and endorser. "Sweetlands" are rapid, accurate and secure, and insure low time-costs, safety to operator, and the avoidance of waste of costly material. They are in a class by themselves.

Just say: "Send Catalog 12-C"

The Hoggson & Pettis Mfg. Co.
New Haven, Conn., U. S. A.

Eclipse Self-Tightening Drill Chuck



Roller bearing.

Quickest and easiest grip, and it never slips.

Self-tightening. No keys or wrenches.

It has no rival in its combination of quick and firm gripping, easy release, simplicity and accuracy.

We have also adapted this hand operated chuck for use on electric drills.

You need it now. Why wait?

Nielsen-Barton Chuck Co., 106 S. Jefferson St.
CHICAGO, ILL.

Also makers of ARBORS for all kinds of Chucks

Contract Work Wanted

This department is exclusively for the use of those desiring to secure contracts for anything in the line of foundry or machine work, including press work, dies, jigs, fixtures, gears, die castings, drop forgings, screw machine products, springs, bolts, nuts, rivets, etc. Advertisements are to be set with side headings as shown, and with such display as may be appropriate to the copy used. Rates: one-eighth page, per month, \$4.

Screw Machine Products	The New Britain Machine Co. New Britain, Conn. Long experience, a complete organization, and the most efficient machinery put a real meaning in the slogan— <i>"Quality, Service, Economy."</i> Large work a specialty. Let us figure on your requirements.
Dies Tools Special Machinery	Robbins, Gamwell & Co. Pittsfield, Mass. Accuracy and efficiency in gages, dies and special machinery, is our specialty.
Dies Gauges Fixtures Special Machines	The Steber Machine Co. Established 1891 Utica, N. Y. Incorporated 1906 We have made a specialty of accurate work for the past 27 years.
Production Work Fixtures Dies	The Perfection Auto Parts Co. 420 Lakeside N. W., Cleveland O. Machining of small forgings and castings in quantity to order. Development and manufacture of dies and fixtures for interchangeable parts.
Drop Forgings (All Kinds)	Bonney Vise & Tool Works, Inc. Allentown, Pa. Quick and Accurate Drop Forging and Finishing Good tools, good men, and good management insure precision and promptness. Investigate; when you know our facilities and our record you'll want our service.
Pressed and Stamped Steel Parts	Geuder, Paeschke & Frey Co. 1325-1700 St. Paul Av., Milwaukee, Wis. It will pay you to let us figure on such pressed, stamped or drawn metal articles or parts as you may require, be they made of steel, aluminum, brass or copper. Our 15-acre plant at your disposal. Get the benefit of our "Knowing how since '81." Send samples or blue prints for est.
Dies, Tools, Special Machinery. Production Work	THOR MACHINE WORKS Racine, Wis. Co-operation—and on time deliveries—extreme accuracy in all measurements—and ripe experience in the building of Dies, Tools, Jigs and special machinery constitute THOR service. Special Production Department for machining of small forgings and castings in quantities.

American Machine Products Company

Detroit, Mich., U. S. A.

MANUFACTURERS OF



THREE AND FOUR GROOVE DRILLS
REAMERS—CUTTERS
SPECIAL TOOLS

Price List and Catalogue Mailed on Request

Special Machinery

Jigs

Tools and Fixtures

Designed or Built

High Grade Work Only
Complete Modern Equipment
Experienced, Skilled Help

Quick Deliveries

The H. E. Harris Engineering Co.
Bridgeport, Conn.

Over \$225,000 Special Offering!!!

New Machines

ATTRACTIVE PRICES

Prompt Delivery From Our Jersey City Warehouse

- 20—20"x8' Walcott Engine Lathes, double back geared, qk. chge.
- 35—Rahn Larmon Co. Make, Engine Lathes, 16"x8', quick change, double back geared, friction head.
- 27—16"x6' American Tool Works, Engine Lathes, quick change.
- 3—17"x10' LeBlond Engine Lathes, heavy duty, double friction geared, quick change, taper attachment.
- 26—16"x6' Cleveland Engine Lathes, 5 with pan beds and taper attachment.
- 2—12"x5' Reed Prentice Engine Lathes, quick change.
- 25—Bardons & Oliver No. 4½ Ontario Screw Machines, friction geared head, with regular equipment.
- 1—No. 2 Becker Vertical Milling Machine with rotary attachments.
- 3—No. 3 Becker Vertical Milling Machines with rotary attachments.
- 1—No. 2 LeBlond Universal Milling Machine, single pulley drive.
- 19—Garvin No. 13 Back Geared Plain Milling Machines.
- 1—Rockford 14" Shaper, variable speed motors, d. c., 220 volts.
- 1—Van Norman No. 4 Internal Grinder with attachments.
- 1—Norton 6"x32" Plain Grinder with full equipment.
- 2—LeBlond Cutter Grinders with power feed and all attachments.
- 1—Rogers 34 Vertical Boring Mill, turret head.
- 2—American No. 1½ Plain Milling Machines.
- 3—U. S. Sensitive Drill Presses.
- 1—Each Norton Crankshaft Grinder, 14"x72" and 20"x96".

New York Machinery Exchange

OFFICES: 50 Church Street, New York

WAREHOUSE: 222-238 Culver Ave., Jersey City

Use this Portable Miller

And Cut the Time in Two

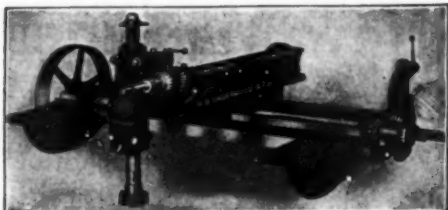


Figure 110

Railway and General Repair Shops have found the Underwood Portable Miller a rapid and accurate tool that enables them to save much time, and to effect a noticeable saving in the cost of repairs.

We can build to suit your special requirements. Figure 110 faces a valve seat 22x40x7 in., or does other milling of similar dimensions. It has power feed in both directions, and is usable in any position, horizontal, vertical or inclined. Operated by hand, small steam engine, air or electric motor.

Our line of Portable Tools includes:

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders; and special machines built to order.

Our Catalog shows many economy tools—write for a copy

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery.

'Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue. Minimum charge, **\$4.00**. Sub-headings are counted as one line, but the name and address of advertiser are not included in the space charged for. No display in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you require is not listed, use the blank enclosed to make known your wants to the publisher.

FOR SALE BY

The Reynolds Machine Company, - - Massillon, Ohio

Cold saw, 12" Burke.
Grinder, 8"x32" No. 11 Landis.
Miller, Pratt & Whitney plain, table 15"x54", travel 8"x14"x30".
Turret lathe, 24"x24" Modern.

FOR SALE BY

J. L. Osgood, - - - 45 Pearl St., Buffalo, N. Y.

Chucking lathe, 21" Potter & Johnston, #350.
Gas engine, 50 h. p.
Keyseater, No. 2 Davis.
Shell cutting-off machine, 14" Williams.
Turret lathe, 12" Brown & Sharpe, #200.

FOR SALE BY

Geo. McCornick Machinery Co., 27 Warren St., New York City

Engine lathe, 12"x5' Worcester, only slightly used.
Grinder, No. 1 Wilmarth & Morman hand surface, with D & W. magnetic chuck.
Grinding machine, Draper & Hall universal tool room, for external, internal and surface work.
Press, V. & O. No. 1 inclinable power, new.
Presses, Foote No. 10 size.
Screw machines, Garvin No. 1 hand, collets.
Shaping machine, 16" Steptoe, back geared.

Electric Drills, Electric Grinders, Chucks.

FOR SALE BY

Brownell Machinery Co., - 11-13 Eddy St., Providence, R. I.

Drills, Langelier, h. s., b. b., bench.	Lathe, 14x6 Worcester.
Drills, 3-spindle Reed-Prentice, b. b.	Lathe, 16x6 Reed, heavy duty.
Drills, 20" W. F. & J. Barnes stationary head, b. g.	Lathe, 16x8 Hendey, taper relieving.
Drills, 3" Taylor & Fenn sens. radial.	Lathe, 18x8 Prentice.
Grinder, No. 2 Morse plain.	Milling machine, No. 25 Bilton, b. g.
Grinder, No. 2 B. & S. universal.	Milling machine, No. 21 Garvin plan.
Grinder, No. 16 B. & S. plain.	Planer, 30x30x10 Powell.
Grinder, No. 6 Diamond disc.	Screw machines, No. 4 W. & S., type g. f. h. 14".
Grinder, No. 2 Diamond horizontal.	

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co.,

725 St. Clair Ave., East, Cleveland, O.

Selections from Stock.

AUTOMATICS.

2½" and 4½" Model A Cleveland automatics, with large equipment, 75%.
No. 24 New Britain automatics, late model, 85%, (2).

BAR STOCK MACHINES.

2" P. & W. screw machine with toolholders, 70%.
3" P. & W. screw machine with toolholders, 70%.
No. 6 Warner & Swasey screw machine, 95%.
Back chasing attach. for Nos. 4 & 6 Warner & Swasey screw mchs., 95%, (4).
No. 3 Foster screw machine, power feed, 80%.

BOLT AND NUT MACHINERY.

No. 14" National bolt cutter, 2-spindle, full set of dies, 99%.
Geometric Tool Co. bolt threaders, 85%, (2).
National bolt header, 80%.
2" Acme single spindle bolt cutter, 85%.

BORING MILLS.

24" Bullard vertical turret lathe, side head, 80%.
S. H. Binsse horizontal boring machine, 18x40" table, 80%.

DRILLING MACHINES.

2-spindle 24" Barnes all geared drill, pump and piping, and spindle with tapping attachment, 85%.
20", 22½", 24" and 28" Sibley, new.
26" Barnes, sliding head, 70%, (3).
26" Barnes, with tapping attach., (2).

GEAR CUTTERS.

No. 3, 26" Brown & Sharpe plain gear cutter, with all parts, 85%.
No. 12 Barber-Colman gear hobber, 80%.

GRINDERS.

W. & M. drill, capacity ½" to 2½", wheel trimming device, 100%.
18" Bryant internal, late model, 75%.
Wet and dry Yankee drill, new.
Bridgeport, wet or dry, 18" wheel, 80%.
10x72 Norton plain, 90%.
6x32 Norton plain, 75%.

LATHES.

16"x 8' Bradford, quick change gear, 80%.
36"x18' Putnam engine, quick change gr., dbl. bk. grd., compound rest, 95%.
Small speed lathe, 10"x5', good.

MILLING MACHINES.

No. 3 Becker vertical, 95%.
No. 6 Becker vertical, cone pulley.
No. 00 Brown & S. plain, hand, 65%.
No. 3-B Brown & Sharpe heavy hi-power, 80%, range 34"x12"x20".
Type A Briggs millers, 90%, (6).
No. 4 Hendey, Lincoln type.
No. 7 Becker Lincoln type, (2).
Rotary milling attachment for No. 6 Becker, 95%.

PLANERS.

36"x36"x16' Hewes & Phillips planer, 2 new swivel heads, new gears, rebuilt throughout by planer company, 80%.
22"x22"x8' Wheeler planer, 80%.

PRESSES.

No. 27 Bliss embossing 2" str., width of bed 32", 1000 tons approx. cap. 80%, (2).
No. 59 Toledo crank, d. b. g., 16 or 18" stroke, friction clutch, 80%, (2).
No. 87 Bliss crank presses, double back geared, 80%, (2).
No. 60½ Bliss rack and pinion drawing presses, 80%, (4).

RADIAL DRILLS.

24" Foodick radial drill, 80%.
No. 1 Barnes horiz. radial, 80%.

SAWS.

11½" Higley bolt cut-off saw, 14" blade, 60%.
Metal band saws, 80%, (2).
Peerless hi-speed, 6" saws; new, (2).

TURRET LATHES.

21" Gisholt, late model, taper attachment, 90%.
24" Gisholt, late model, taper attachment, 90%.

SPECIAL.

Guillotine type shear, Cleveland, capacity 4"x4", 85%.

SECOND-HAND MACHINERY

Cyril J. Bath & Co.—Continued.

MISCELLANEOUS.

Annealing furnaces, 25'x8' Rockwell, double door, (5).
 Annealing furnace, 16'x8' Rockwell, double door.
 Above equipped with oil and gas burners, recording and indicating pyrometers, air rams and pulleys.
 Accumulator, Southwark, 21" hydraulic.
 Air compressor, Ingersoll-Sargent, with 50 h. p. motor.
 Broaching machine, No. 2-A Lapointe, 85%.
 Die head, 4½" Geometric, 80%.
 Hammer, power, 100 lb. Mayer, belt drive, regular equipment, new.
 Hammer, 6-ton Morgan steam forging, 84" stroke, 26" cylinder, 8" rod, dbl. frame, 90% condition, weight approximately 300,000 lbs.
 Motor, 75 h. p. Westinghouse, good condition.

FOR SALE BY

Clinton Machinery Exchange,

113 S. Clinton St., Chicago, Ill.

Band saw, 36".
 Boring mill and miller combined, Franklin, power.
 Elevator, portable, 1,000 lbs. cap.
 Gear cutter, Gould & Eberhardt auto.
 Gear cutters, Flather automatic, perfect condition, (2).
 Lathe, 14x6 Pratt & Whitney, 90% new.
 Lathes, 18x7 Chard, 95% new, (6).
 Lathe, 20x8 Sidney, 95% new.

Lathe, 20x9 Lodge & Shipley, 95% new.
 Miller, Garvin No. 21.
 Miller, Hendey No. 2½, qk. change.
 Millers, hand, U. S., (2).
 Motors, all sizes.
 Screw machine, ½" Garvin.
 Screw machine, ½" D. W. No. 2.
 Screw machine, 1½" Smurr & Kamen.
 Tinnern's rolls, all sizes.

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

13"x 5'6" new Carroll-Jamieson, p. c.
 15"x 6' new Sidney, q. c., swings 17".
 17"x 8' new Sidney, q. c., swings 19".
 19"x 8' new Sidney, q. c., swings 21".
 19"x 8' LeBlond, q. c.

20"x 8' Whitcomb Blaisdell, q. c.
 25"x 14' new Sidney, q. c., swings 27".
 26"x 12' Bridgeford, q. c., d. b. g.
 36"x 16' New Haven, quick change.
 42" Niles car wheel lathe.

VERTICAL BORING MILLS.

42" Niles car wheel.

PLANERS.

36"x36"x13' Rockford, four heads.
 36"x36"x12' Flather, two heads.
 36"x36"x 8' Gray, two heads.

31"x23"x68" Smith, one head.
 18"x18"x 3' Wheeler, one head.
 40"x40"x10' Powell, two heads.

SHAPERS.

14" new Steptoe.
 14" Smith & Mills, new.

16" Smith & Mills, new.
 20" Steptoe.

MILLING MACHINES.

No. 4 Brown & Sharpe, plain.
 No. 1½ new American, plain.
 No. 3A Garvin, universal.
 No. 6 used Whitney, hand.

No. 1½ used Valley City, plain.
 No. 1 new United States, hand.
 No. 2 Cincinnati, plain.
 No. 2 Van Norman duplex.

DRILLING MACHINES.

72" Western, full universal.
 36" new Superior, sliding head.
 32" new Superior, sliding head.
 25" new Superior, sliding head.

25" new Superior, sliding head.
 25" Barnes b. g., p. f.
 1, 2 & 4 spindle, Allen.

POWER PRESSES AND HAMMERS.

No. 78½ Bliss f. g.
 No. 126 Max Ams.

No. 121 Max Ams.
 25 lb., 50 lb. and 100 lb. hammers.

SECOND-HAND MACHINERY.

FOR SALE BY

Norton Brothers Mchy. Co., 6th & Baymiller Sts., Cincinnati, Ohio

LATHES.

- 38"x16" New Haven, blocks for 52".
- 30"x17" Davis and Egan, hollow spindle, comp. rest, taper attach., 24" chuck.
- 19"x10" Superior, 3 step, quick change gears, nearly new.
- 20"x10" LeBlond, 16" 4-jaw chuck.
- 20"x 8" American, quick change, taper, 18" chuck.
- 18"x 8" Bradford, American, Rahn.
- 14" & 16" LeBlond, Bradford.
- 12", 13" & 14" Pratt & Whitney, LeBlond and Bradford makes.

TURRET LATHES.

- 3"x30" Jones & Lamson.
- 18" Gisholt.
- 18"x10" American, hexagon, power feed and stops.

SHAPEKERS.

- 14" Steptoe crank.
- 20" Ohio crank.
- 20" Steptoe geared, \$275.

PLANERS.

- 24x24x 6 G. A. Gray, 1 head.
- 60x60x16 Niles 2 heads.

DRILLS.

- 15", 20", 24", 28", 30" and 32" upright.
- 3", 4", 5" and 5 1/2" Bickford and Niles radials.

MISCELLANEOUS.

- Automatic, 3 1/2" National Acme, 4 spindle, nearly new.
- Boring mill, 30" Niles turret.
- Milling machine, plain, No. 3 Becker-Brainard.
- Milling machine, plain, No. 4 Cincinnati.

FOR SALE BY

Chas. Molitor Machinery Co.,

124 S. Clinton St., Chicago, Ill.

LATHES.

- 36"x14" Putnam.
- 28"x14" LeBlond heavy, qu. ch., taper.
- 26"x12" Putnam, heavy duty, qu. ch.
- 28"x10" American, quick change.
- 22"x10" Hamilton, q. c., d. b. g., (2).
- 22"x10" LeBlond, quick change.
- 21"x 8" LeBlond.
- 20"x14" Prentice, double b. g.
- 20"x10" Lodge & Shipley, qu. change.
- 20"x 8" Davis, dbl. back geared, (2).
- 18"x 8" Chard, semi-quick change.

PLANERS AND SHAPER.

- 48"x48"x12" Flather, 3 heads.
- 26" Smith & Mills gear frict. shaper.
- 24"x24"x 6" Pond, 2 heads.

GRINDERS.

- No. 4 B. & S. universal.
- 10"x30" Landis.
- Miller and grinder, Saxon vertical.
- 12"x32" Landis.
- Kotary grinder, N. Y. Safety Co.
- 22"x3" Wells.

MILLING MACHINES.

- No. 3A Brown & Sharpe universal.
- No. 2 Brown & Sharpe universal.
- No. 2" Brown & S. univ., hvy., (2).
- No. 25 Becker plain back geared.

PUNCH PRESSES AND HAMMERS.

- Waterbury fdry adjustable stroke.
- 16" triple back geared. (3).
- 20" to 34" Adrian & Crosby, single and double crank arch presses. (4).
- No. 3 Royersford double punch and shear.
- 500 lb. drop hammer.

SCREW MACHINES AND TURRET LATHES.

- 2" Pratt & Whitney.
- No. 4 Warner & Swasey, (2).
- 1 1/2" Superior.
- 1 1/2" Pratt & White, (4).
- 22" Greenlee, (4).
- 24" Libby.
- 16" Gisholt special, heavy, (6).
- 1 1/2" Acme, (2).
- 1" Smurr & Kamen.
- 1" Milholland.
- 3" Jones & Lamson, (2).
- No. 6 Foster.

SECOND-HAND MACHINERY

FOR SALE BY

Harris Brothers Company, 1475 W. 35th St., Chicago, Ill.

ENGINE LATHES.

Triple geared, screw cutting:

48"x30' Fifield, 25' center.

Screw-cutting quick change mechanism, 3-step cone, dbl. bk. grd., comp. rests:

18"x 6' Ryerson, (4). | 20"x10' Canada Machy. Corp., (5).

With turrets on carriage with compound rests:

18"x 6' Canada Machy. Corp., (2). | 20"x 8' McDougall, (3).

With loose change gears, 3-step cones, dbl. back grd., and compound rests:

18"x 8' Sidney, (3). | 18"x 8' Milwaukee, (6).

With loose change gears, compound rests, single back geared:

18"x 6' Cincinnati, | 21"x 7' Bertram.

18"x 6' Giddings & Lewis, (4). | 10' Wells speed lathes, (10).

Plain turning lathes with plain rests. (Not screw cutting):

16"x 6' Rockford, pan bed, (10) | 20"x 8' Simplex, (4).

With turret on carriage but without plain rest:

18"x 8' Milwaukee, (10).

All the above lathes have hollow spindles and countershafts.

DRILL PRESSES.

Colburn 25" heavy duty, high speed, No. 5 Morse taper, sgl. pulley drive, (9).

8-spindle 40" Bausch adjustable multiple-spindle drill, capacity 1" and 20" circle.

GRINDERS.

Wells Bros. cutter and reamer. | $\frac{1}{2}$ h. p. Electric grinders, (5).

Ford Smith cylindrical grinders, (2).

TURRET LATHES.

W. P. Davis 24" swing set over turret, all power feeds, (2). | Jones & L. 3"x36" bar outfit, (3).

MILLING MACHINES.

Hendey Lincoln type Millers with quick change feed, 20" automatic feed to table, (25).

No. 2 & No. 3 Brown & Sharpe universal.

Ingersoll combined knee type vertical and horizontal milling machine, table 16"x30", all power feeds.

Niles-Bement-Pond. No. 9 vertical milling machine with power feed, rotary table, 48" swing, 24" diam. table, weight about 8000 lbs.

Newton No. 3 vertical milling machine, power feed, rotary table.

SLOTTER.

20" Niles vertical slotter with rotary table.

SHAPERS.

20" Cincinnati bk. grd. shaper, p.d.f. | 20" P. N. A. open-side shaper.

PUNCH PRESSES.

Williams straight sided, b. grd., sgl. action punch press, 22" between uprights.

HAMMERS.

Board lift drop hammers, 1000 lb., (2).

PUNCHES AND SHEARS.

Alligator shear for 14" beam shear for 15" "1" beam.

Hilles & Jones sgl. end punch, 8" throat, architectural jaw, cap. $\frac{1}{2}$ " thru $\frac{3}{4}$ ".

BENDING ROLL.

8' Lennox plate bending roll, $\frac{1}{2}$ " cap., drop end housing, friction clutch drive.

TRAVELING CRANE.

Niles electric traveling crane, 46' span, 15 ton cap., with auxiliary hoist, 5 ton, 4 motor type, 220 d. c.

Our complete Machinery Bulletin sent upon request.

SECOND-HAND MACHINERY

FOR SALE BY

B. C. Allen Machinery Co.,

104 S. Clinton St., Chicago

Cock grinder.....	\$ 75.	Miller, Wisconsin, hand ver. att. \$	250.
Die grinder.....	80.	Miller, Steptoe hand.....	400.
Drill press, 15" Rockford.....	75.	Miller, No. 1 plain.....	475.
Drill press, Barnes friction.....	45.	Miller, No. 4 Garvin plain.....	250.
Drill press, Burke bench.....	25.	Miller, Hendey, Lincoln q.c.g.	300.
Drill press, Barnes 24" b. g....	160.	Motors, 1-3 h. p., sgl. phase.	
Drill press, 26" skd. hd.....	250.	Motor, No. 3 Becker-Brainerd,	
Drill press, 25" Hamilton, slid-		plain.....	900.
ing head, tapping attach.....	425.	Pipe machine, 2", with Landis	
Drill press, 26" Barnes 3-spdl.	250.	die head.....	200.
Drill press, 20" heavy duty.....	225.	Pipe machine, 1 1/2".....	125.
Emery grinders, Nos. 1, 2, 3 & 4.		Planer, 22" x 22" x 5" Fitchburg	325.
Lathe, 18" x 10" Rahn, Carpenter	500.	Planer, 27" x 27" x 7" New Haven	250.
Lathe, 18" x 6" taper attach.....	375.	Press, foot.....	35.
Lathe, 16" x 8" Walcott.....	385.	Press, foot heavy.....	50.
Lathe, 20" x 8" Gray.....	425.	Punch press, No. 2 inc.....	185.
Lathe, 18" x 7" Chard, dbl. back		Punch press, No. 3 inc.....	390.
gears, heavy duty.....	725.	Screw machine, 1" P. & W.....	200.
Lathe, 26" x 9" Bridgeford, q.c.g.,		Shaper, crank, 15".....	375.
3 step cone, 2 1/2" hollow sp....	950.	Shaper, 16" b. g. crank.....	535.
Lathe, 36" x 16" Putnam.....	1000.	Shaper, 14" Hendey.....	225.
Lathe, 2" x 24" J. & L. fric. hd.	350.	Shaper, 24" Steptoe.....	425.
Miller, No. 5 Burke, hand.....	250.	Tinners' tools.....	
Miller, double end valve.....	125.	Watchmakers' tools.....	

FOR SALE BY

Badger-Packard Mch. Co., 133-139 W. Water St., Milwaukee, Wis.

AUTOMATICS.

7/16" Hartford.

3/4" Hartford.

DRILLING MACHINES.

3-spindle 3/4" capacity sensitive.

3-spd. 29/32" cap. Allen sensitive.

4-spd. 29/32" cap. Allen sen., (2).

5-spd. 29/32" cap. Allen sen., (2).

GRINDERS.

No. 3 Diamond wet tool.

Gorton double disc.

72" Holmes auto. knife

Sterling universal tool and reamer
95% new.

LATHES.

12" x 6" Blaisdell, 4 s. c., s. b. g.

14" x 6" Lathe & Morse, 4 s. c., s. b.

g., l. c. g.

16" x 6" Reed plain turning, not
screw cutting.

MILLING MACHINES.

Whitney hand miller.

No. 3 Rockford hand miller.

10x50 Hendey Lincoln.

20x10 Hendey Lincoln.

No. 12 Pratt & Whitney Lincoln, (2).

TURRET LATHES AND SCREW MACHINES.

11" x 18" Pratt & Whitney turret lathe, (10).

24" x 26" Pratt & Whitney turret lathe.

24" Davis turret boring and forming lathe.

MISCELLANEOUS.

Gear cutter, 36" x 9" Gould & E.

Gear cutter No. 2, Whiton auto.

Planer 24" x 24" x 16" Fitchburg.

1 1/2" x 17" Hartford.

1 1/2" 4-spindle Gridley, (2).

4-spd. 1/2" capacity Sigourney.

20" Snyder.

30" Prentice, s. h.

20" 4-spd. Barnes, all geared, (2).

10x20 Landis universal.

Cleveland profile with motor for a.
c. or d. c., practically new.

No. 160 Wells plain cutter & reamer.

No. 10 Pratt & Whitney auto.

No. 12 Pratt & Whitney auto., (3).

Taylor & Fenn vertical, (3).

Briggs high duty, 16", type "A."

16" x 8" Goddard 5 s. c., s. b. g., l. c. g.

18" x 8" Prentice all geared, s. p. d.

20" x 8" American, 3 s. c., d. b. g., q. c.

20" x 8" Flather 3 s. c., s. b. g., l. c. g.

20" x 10" Bridgeport 4 s. c. s. b. g., l. c. g.

No. 10 Pratt & Whitney auto.

No. 12 Pratt & Whitney auto., (3).

Taylor & Fenn vertical, (3).

Briggs high duty, 16", type "A."

Pipe machine, No. 4 Loew-Victor,

4" capacity.

Shaper, crank, 16" Niles, b. g.

SECOND-HAND MACHINERY

FOR SALE BY

Brown-McDonald Machinery Co., 2323 N. 9th St., St. Louis, Mo.

BORING MILL.

42" Bullard, vertical, 2 heads, 1 turret swiveling, 1 plain, used.

LATHES.

13"x 6" South Bend, c. r., h. s., new.	26"x12" Walcott, q.c.g., d.b.g., new.
15"x 8" South Bend, c. r., h. s., new.	16"x 8" American, q. c. g., used.
14"x 6" Walcott, q.c.g., d.b.g., new.	20"x10" Walcott & Wood, h. s., cpd.
16"x 8" Walcott, q.c.g., d.b.g., new.	r., used.
18"x 8" Walcott, q.c.g., d.b.g., new.	14"x 6" Fitchburg, s. s., p. r., used.
20"x10" Walcott, q.c.g., d.b.g., new.	

DRILLING MACHINES.

No. 1 Burke, bench, with chucks, new.	20" Silver, s. b., w. & l., new.
14" Excelsior, 2 tables, new.	20" Silver, s. b., b. g., p. f., new.
1" Leland Gifford, high speed, with pump.	20" Champion, s. b., w. & l., new.
	20" Champion, s.b., b.g. & p.f., new.
	26" Aurora, b. g., p. f., new.

SHAPERS.

16" Whipp, single gear, new.	Rhodes Nos. 1 and 3 horizontal and vertical, new.
20" Milwaukee, b.g., latest imp., new.	24" Walcott, b. g., new.
18" & 24" Hollingsworth, new.	
24" Gould & Eberhardt, used.	

SCREW MACHINES.

No. 4 Smurr & Kamen, geared friction head, p. f. to turret, new.
 No. 4 Defiance, geared friction head, p. f. to turret, used.
 No. 52 National Acme automatic, used.
 Wood Tilted Turret 14", used.

MILLING MACHINES.

Hendey, Lincoln Type.
 No. 2 American Lincoln, b. g., new.
 No. 1 U. S. hand, vise and arbor, new.
 No. 2 Pratt & Whitney, Lincoln type, used.

PRESSES.

No. 1 Loshbough-Jordan, o.b.i., new.	No. 3 Kohler, o. b. i., used.
No. 3 Bliss "Stiles".	No. 1 Greenerd, arbor, used, (9).
Punch press, pl., wt. 3000 lbs., used.	No. 2 Greenerd, arbor, used, (6).

SAWS.

Nos. 1 & 2 Marvel, draw cut, new. | Williamson, metal, used.

GRINDERS.

Nos. 1, 2 & 3 Western, d. e., new.	Esaley, cylindrical.
Nos. 1, 2 & 3 St. Louis, d. e., new.	No. 190 Wells, reamer & cutter, new.
No. 20 Safety E. W. Co., elec. (4).	Greenfield univ. tool & cutter, used.
U. S., electric, 110 v., d. c., bench.	Nos. 2 American, surface, new.

COMPRESSORS.

Nos. 2, 3 & 4 Model B, vertical, belted, new.
 Curtis 8x8 double cylinder, belt drive, (3).

MISCELLANEOUS.

Brake. 6 & 8', steel.	Pipe mch., No. 86 Forbes. 4", used.
Bolt threader, No. 734 Greenfield, new.	Pipe machine, No. 76 Forbes, 3", used.
Filing mche. No. 2 Cochran-B. used.	Pipe machine, 3" Borden, hand.
Motor, 5 h. p. General Electric, 3 ph., new.	Planer, 36"x36"x15' Patch, o. s., 1 hd. on cross rail, 1 head on side, used.
Motor, 10 h. p. General Electric, 3 ph., new.	Punch & riveter, wt. 16000 lbs. 5' tht.
Motor, 1 h. p. Advance, sgl. ph., new.	No. 3 Hilles & Jones, stake, used.
Pipe cutter, B. & K., 4" cap.	Large stock of tinners' tools.

CHUCKS.

5" & 9" 3-jaw Sweetland, scroll, new.	5", 6", 7 1/2", 9" 3-jaw Cushman, universal, used.
8-12-14-16" 4-jaw Sweetland, independent, new.	

SECOND-HAND MACHINERY

FOR SALE BY

McCoy-Brandt Machinery Company

Office and Warehouse, 210-218 Penn Ave., Pittsburgh, Pa.

HAMMERS.

Board drop, 2000 lb. Toledo.
Steam drop, 3000 lb. Morgan.

Steam. 600, 700, 1000, 2000, 10000, 12000
and 14000 lb. double frame.

LATHES.

44"x30' Fifield, triple geared.
48" car wheel turning, m. d.
24"x12' S. B. & E., c. r., 18" chuck.
24" and 20"x10' LeBlond, q. c. g.

20"x 8' LeBlond, q. c. g., t. a.
17"x 8' Sidney, q. c. g., d. b. g.
16"x 6' LeBlond, c. r., chuck.
Speed lathes, 18" and 13", 4' bed.

PUNCHES, SHEARS AND ROLLS.

15" tht., dbl. cap. 1 1/2"x1", No. 13 W.-W.
30" throat, cap. 1 1/2"x1", Cincinnati.
Guillotine shear, cap. 1" & 2".
Slitting shear, rotary, 23" tht., cap. 4".

Squaring shear, 122", cap. 3-16".
Squaring shear, 26", cap. 16 ga., pwr.
Squaring shear, 53", cap. 14 ga.
Rolls, 10' Bertsch, cap. 14" gauge.

PLANERS, MILLERS AND SHAPERS.

72"x48"x16' Pond, 2 heads.
20"x30"x10' Sellers, 1 head.
24"x24"x 6' American, 1 head.
No. 2 Cleveland univ., near new.
No. 3 B. & S. univ., index head.

No. 3 Cincinnati plain.
16" Smith & Mills.
20" Steptoe crank, geared.
24" Cincinnati, crank, back grd.

MISCELLANEOUS.

Bulldozers, Nos. 4 and 9 W.-W.
Drill, 8-spindle gang, Foote-Burt.
Drill, 28" back geared, power feed.
Drill, 24" Barnes, plain, sliding hd.
Pipe machines, 2", 6" and 8".
Press, B. & S., 4" stroke, 9125 lbs.

Presses, Ferracute Nos. DGG-56,
D-201, D-301 and EG-6, all st. sided.
Presses, Ferracute Nos. E-56 and
E-57, toggle.
Presses, No. 59 1/2, Toledo, 6" stroke.

Quick shipments from stock.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

LATHES.

14"x 6' Hamilton, tool room, q. c.
14"x 6' LeBlond, plain change.
17"x 7' Oliver, quick change.
20"x 8' Lodge & Shipley, all g. h.
18"x19' Lodge & Shipley, with taper.
21"x10' LeBlond, heavy duty, q. c.

24"x10' Rahn & Larmon, h. duty, q. c.
25"x15' Johnson, plain change.
25"x20' Johnson, plain change.
24"x22' F. E. Reed, plain change.
54"x16' Putnam, plain change.

PLANERS.

24"x24"x 5' New Haven.
32"x32"x 6' Hewes & Phillips.

32"x32"x10' Niles, 2 heads.
36"x36"x 8' Gray, 2 heads.

DRILLING MACHINES.

25" Superior, sliding head.
24" Cincinnati, all geared.
28" Lodge & Davis.

34" heavy sliding head.
20" Baker Bros.
40" Dreses, heavy duty.

MILLING MACHINES.

No. 4 Becker, vertical.
No. 4B Becker, vertical.
No. 2 Brown & Sharpe, old style.
No. 2 Kempsmith, universal.
No. 3 Cincinnati, universal.

No. 4 Cincinnati, universal.
No. 3 LeBlond, plain.
No. 3 Owen, plain.
No. 4 Brown & Sharpe, plain.
Owen duplex miller.

GRINDERS.

No. 10 Besly disc grinder.
No. 3 Detroit, 20"x3" wheels.

12"x24" Modern plain.
10"x36" Cincinnati.

MISCELLANEOUS.

Blowers, No. 2 and No. 3 Root.
Bulldozer, No. 3 Fisher.
Exhaust fan, 72" Sturtevant.
Gear cutter, 28" Cincinnati.

Lettering machine, Noble & W.
Lettering machine, Matthews.
Screw machine, 2" Pratt & Whitney.
Screw machine, 2" Warner & Swasey.

SECOND-HAND MACHINERY

FOR SALE BY

Stocker-Rumely-Wachs Co., 117-121 N. Jefferson St., Chicago

In stock for immediate delivery.

BORING MILLS.

Industrial Works horizontal, 24" bar.

60" Bullard 2 plain heads.

76" Bullard, 2 plain heads.

DRILLING MACHINES.

12" Leland Gifford, h. s., ball bearing, single spindle.

No. 4 Avey, h. s., ball bearing, single spindle.

Henry & Wright, h. s., ball bearing, single spindle, class B.

Henry & Wright, h. s., ball bearing, six spindle.

60" Bickford, back geared, power feed.

8" Fosdick radial drill.

6" Gang radial drill.

6" Prentice radial drill.

GEAR CUTTERS.

No. 3 26" Brown & Sharpe.

30"x8" Gould & Eberhardt.

8" Gleason automatic gear cutter.

GRINDERS.

No. 1 LeBlond cutter and tool grinder.

No. 1 Cincinnati cutter and tool grinder.

No. 12 Brown & Sharpe universal grinder.

No. 1 Brown & Sharpe universal grinder.

6"x32" Norton grinder.

8"x40" Morse grinder.

No. 12 Modern grinder.

No. 10 Besly disc grinder.

8" Heald piston ring grinder.

LATHES.

13"x7" Willard, compound rest, double back gear.

13"x8" Willard, compound rest, double back gear.

14"x6" Bradford, double back gear, taper attachment.

16"x8" Hamilton, q. c. g., taper, relieving, pan bed.

16"x8" Bradford, double back gear, compound rest.

20"x10" Hamilton, double back gear, compound rest.

22"x10" Bradford, double back gear.

24"x12" Bradford, quick change gear, double back gear.

30"x12" Baisdell, compound rest.

32"x18" Bradford, compound rest.

37"x18" Fifield, compound rest.

MILLING MACHINES.

No. 3 Burke hand miller.

No. 0 Rockford plain miller.

No. 2 LeBlond plain miller.

Type 'B' Briggs miller.

No. 5 Hende, Lincoln type miller.

No. 13 Brown & Sharpe miller.

SCREW MACHINES.

No. 6 Foster, friction head, auto. chuck and wire feed, power feed to turret.

No. 9 Bardons & Oliver, friction head, automatic chuck and wire feed, power feed to turret.

24" Gisholt turret lathe.

2"x24" Jones & Lamson turret lathe.

3"x36" Jones & Lamson turret lathe.

Potter & Johnston turret lathe.

2" Cleveland, automatic.

No. 2A Warner & Swasey turret lathe.

MISCELLANEOUS.

Motor, 20 h. p., G. E., 220 v., 460 to 1200 r. p. m., new.

Planer, 42"x50"x12" Gray, 2 heads.

Shaper, 16" Milwaukee.

Shop saw, No. 5 Marvel.

Slotter, 18" Canadian Machinery & Corporation.

SECOND-HAND MACHINERY

FOR SALE BY

Federal Machinery Sales Company,

8 N. Jefferson St., Chicago, Ill. 208 Sycamore St., Milwaukee, Wis.

Good Used Tools.

Bolt cutter, National 14", double head.
Cold saws, No. 1 and No. 3 Burr.
Drill, No. 14 Colburn heavy duty, all geared, 18" table.
Drill, 28" old style sliding head upright.
Gear generator, 14" Lees-Bradner.
Gear hobbess, two No. 2 Adams, one new.
Gear cutter, 36" Brown & Sharpe, spur.
Gear cutter, 48" Brown & Sharpe, spur.
Grinder, 12"x60" Landis plain.
Lathe, 16"x8' Milwaukee.
Lathe, 16"x8' Walcott & Wood, h. s., c. r.
Lathe, 16"x8' old style Gray, engine.
Lathe, 16"x8' Lodge & Shipley, with taper attachment.
Milling machine, No. 1 Davis & Egan plain.
Miller, Gooley & Edlund type "B," with 42" table feed.
Pipe machine, 4" Victor.
Shaper, 12" Hendey.
Thread miller, No. 8 Lees-Bradner, 4'6" centers.

FOR SALE BY

The E. A. Kinsey Co., Cincinnati, Ohio. Indianapolis, Indiana

DRILLING MACHINES.

3' Fosdick radial drill.
2' Fosdick plain radial, box column.
5' Fosdick plain radial, box column.
3" type T., U. S. Elect. 220 v., 60 cy.
1" type BA-1 U. S. Electric, 220 volts, 60 cycle, 3 phase.
Baush 4-spindle multiple.
20" Barnes, lever feed.

GRINDERS.

14" J. C. Blount wet tool.
8-spindle Cock grinder.
Water tool, 26 in. wheel.
Wesche electric buffing, a. c. motor.

LATHES.

10x8' Champion engine, plain rest.
14"x8' Monarch, d. b. g., c. r.
14"x8' Bradford, p. f., turret, pan bed.
16"x8' Leblond, q. c., c. r.
18x10' LeBlond engine, q. c., 16" chk.
20"x8' Fay & Scott, hex. turret on shears.
20x10' Bradford, 2 c., c. r.
21x8' Bradford engine, 18" 4-jaw chk.
24"x26' Porter, engine, q. c.

PLANERS.

18' Niles-B.-P. plate, 4" steel plate.
54-54x30 H. P. Betts; rev. d. c. motor.

TURRET AND SCREW MACHINES.

No. 1 Am. Tool & M. Co., sq. ar., a. b. g., 4 s. c.
No. 2 Garvin, w. f., power feed turret, automatic chucks.
No. 2 Warner & Swasey. (2).

MILLING MACHINES.

No. 2-B B. & S. plain.
48" Newton plain.
Newton 21"x8' double housing slab.
No. 6 Whitney hand miller.

MISCELLANEOUS.

Band saw, 36" Towsley, with motor.
Bar and chucking outfits, No. 2 A Warner & Swasey.
Boring mill, 42" Niles. 2 heads.
Boring mill, Pond vertical, 8' table, 11' between uprights.
Boring and milling machine, No. 2 Fosdick horizontal.
Centering att., Carroll No. 2, cap. to 2".
Chain machine, Cross & Spiers.
Chuck, 12" universal.
Cutting-off mch., 3" Hurlbut-Rogers.
Gas furnace, No. 93 Stewart dbl. end.
Gear cutter, 26" No. 3.
Gear shaper, No. 6 Fellows, nearly new.
Gear tester, B. & S., complete.
Oil pump, Trahern No. 1 F. rotary.
Profiler, Pratt & W. No. 12, belt.
Saw bench, Beach, table, 36x54".
Special internal grinding fixture, Brown & S., for No. 1 universal.
Tapping machine, Garvin No. 1.
Vise, flanged, Brown & Sharpe No. 4.

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company, 111 Broadway, New York
Located at our various factories and stores.

LATHES.

14"x 6' Bradford, c. r.	36"x28' Niles, c. r.
15"x 7' P. & W. speed lathe.	28"x18' Niles, c. r.
16"x 8' Reed, r. & f. rest.	28"x30' Niles, c. r.
18"x 8' LeBlond, quick change.	36"x14' Niles, c. r.
21"x8' LeBlond, geared head, heavy duty.	42"x20' Niles, c. r.
22"x 8' Niles, c. r.	48"x30' Niles, c. r.

TURRET LATHES.

No. 6A Potter & Johnston automatic, motor drive.
2"x24" Jones & Lamson, cone head.
2"x28" Pratt & Whitney turret lathe.
28" size J. Gisholt, 34" spindle.
24" size I Gisholt, 220 volt, motor drive, d. c.
28" Milwaukee rigid.
34" size K Gisholt.

SHAPERS AND PLANERS.

14"x 6' Niles sgl. trav. head shaper.	38"x38"x16' Niles, 3 heads.
20" G. & E. crank shaper.	44"x44"x16' Niles, 4 heads.
30"x30"x 6' Pond, 2 heads.	44"x44"x20' Niles, 4 heads.
30"x30"x 8' Pond, 2 heads.	48"x48"x10' Niles, 4 heads.
30"x30"x10' Pond, 2 heads.	54"x54"x20' Niles, 4 heads.
30"x30"x12' Pond, 2 heads, 220 v., d. c., reversing motor drive.	60"x60"x20' Niles, 4 heads.
38"x38"x12' Niles, 4 heads.	72"x72"x24' Niles, 4 heads.

MILLERS AND GEAR CUTTERS.

No. 3 Brown & Sharpe universal, old style.
No. 3 36"x8" Brown & Sharpe gear cutter.
No. 4 36"x9" Brown & Sharpe gear cutter.
No. 6 60"x12" Brown & Sharpe gear cutter.
15" Gleason bevel gear generator.

DRILLING MACHINES.

60" Niles, heavy vertical.	4' Niles full universal radial.
3' Grant radial drill and boring mch.	5' Niles semi-universal, old style.
4' Prentice speed box radial.	6' Niles semi-universal, old style.
4' Niles semi-universal, old style.	

GRINDERS.

4"x30" No. 11 Brown & Sharpe pl.	39" grindstone frame, B. & S.
12"x66" No. 4 Landis universal.	

BORING MACHINES

No. 1 Bement horizontal, 33" spindle, 5' table.
No. 2 Bement horizontal, 33" spindle, 6' table.
No. 3 Bement horizontal, 44" spindle, 9' table.
42" Niles boring and turning mill.

MISCELLANEOUS.

Air compressor, type 10, Ingersoll-Rand, steam driven, capacity 535'.
Air compressor, Ingersoll-Rand duplex, motor driven, with 35 h. p., d. c. motor, capacity 215'.
Air compressor, Gardner duplex, steam driven, 637'.
Blower, No. 10 Sturtevant.
Blower, No. 70 Buffalo.
Blue print mch., Wagenhorst, 60", vertical cylinder.
Crane, 20 ton, 48' span Sellers, 220 volts, direct current.
Engine, 164 h. p. McEwen, direct connected to 100 k. w. generator, d. c. 220 v.
Profiler No. 3 automatic, Keller.
Saw, 8" rounds, Higley.
Slotter, 6" Bement.

SECOND-HAND MACHINERY

FOR SALE BY

E. L. Esley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

32" W. F. & J. Barnes, sliding hd. 24"—2 sp. Barnes gang drill.
No. 1 Avey single spindle. No. 2-D 24" Minster, heavy duty.

LATHES.

14"x6' Star Tool Co. 20"x 8' Hamilton.
16"x 8' Von Wyck, taper att. 22"x12' Greaves-Klusman.
17"x 5' LeBlond heavy duty. 24"x12' Prentice Bros.
18"x 8' Bradford, q. c. g., taper att. 36"x14' Bradford.

MISCELLANEOUS.

Broaching machine, No. 3 Lapointe. Punch press, No. 64-A Consolidated.
Cold saw, No. 14 Higley. Screw mach., No. 1 Garvin, pl. hd.
Drill, horiz., No. 1 W.F. & J. Barnes. Screw mach., No. 3 Foster, pl. hd.
Gear cutter, No. 3 B. & S. auto. Screw mach., No. 4 Foster, pl. hd.
Hammer, steam, 800 lb. Massillon. Shaper, 16" Smith & Mills crank.
Miller, No. 21 Hendey, Lincoln type. Tool grinder No. 1 Cincinnati.
Miller, No. 2 Kearney & T. plain. Turret lathe, 2"x24" J. & L.
Miller, No. 1 Beaman & S. slab. Turret lathe, No. 2 Pratt & W.
Planer, 32"x32"x8' New Haven. Turret lathe, 18"x6' Fulton.
Planer, 32"x32"x12' Davis & Egan. Turret lathe, 3x36" Jones & L.
Planer, 42"x42"x8' Whitcomb. Turret lathe, 24" Conradson.
Punch, Sellers single end, 26" thr.

FOR SALE BY

The O'Brien Machinery Co., 119 N. Third St., Philadelphia, Pa.

Boring and turning lathes, 26"x10' Walter Scott, 2-step cone, d. b. g., 5" belt; some fitted with turret on carriage, six 3" holes in turret; turning lathes swing 5' 4" between centers, 22" over carriage; price low for quick sale; photo and complete specifications on request, (12).
Boring mill, 32" Rogers, turret hd.
Drill, Allen single spdl., high speed.
Drill, Allen 5-spindle, high speed.
Drill, Allen 6-spindle, high speed.
Drill, 16 spdl. Baush multiple spdl., capacity 16—1" holes.
Drills, Allen 2-spdl. high speed, (5).
Hammer, 2,000 lb. United Engine Co. board drop.
Hammer, 1,000 lb. Massillon st. drop.
Hammer. Several 1,000 lbs. Chambersburg board drop.
Hammer, 600 lb. Chambersburgh board drop.
Hammer, 600 lb. Chambersburg board drop.
Jointer, 24" Oliver heavy duty.
Lathe, 18"x8' Davis.
Lathes, 16"x6' Reed, (2).
Lathe, 8"x106" Fitchburg Lo-Swing.
Lathe, 18"x8' American.
Lathe, 22"x8' Davis, taper att.
Lathe, 20"x8' Reed, taper att.
Lathe, 36"x20' Bridgeford.
Lathes, Seneca Falls, (4).
Lathe., 26"x24' Bement.
Lathes, 21"x8' LeBlond, (2).
Lathe 24"x10' National.
Lathe, 65"x18' Bement.
Miller, No. 1 Milwaukee universal, vertical attachment.
Miller, No. 21 Garvin plain.
Miller, No. 1 Garvin, universal, vertical attachment.
Millers, No. 3 Fosdick hand, (3).
Millers, Kempsmith No. 32 Lincoln type, (3).
Millers, No. 7-H Becker, Lincoln type, (5).
Millers, No. 6 Whitney, hand, (6).
Pipe machine, 2" Cox, heavy duty.
Pipe machine, 2" Williams.
Planer, 16"x16"x3' Pratt & Whitney.
Planer, 30"x30"x8' New York Safety.
Planer, 36"x36"x12' Harrington.
Planer, 38"x36"x14' Fitchburg. 2 hds.
Planer, 40"x40"x10' Powell. 2 heads.
Planer, 42"x42"x8' Sellers, 1 head.
Planer, 30"x30"x10' Sellers.
Presses, Chambersburg No. 2 drop forge trimming, with side shear attach., approx. 9400 lbs. each, (4).
Press, No. 5 Stiles, heavy geared.
Punch and shear, single end, capacity 1" in 4", new.
Radial drill, 30" Drees, plain.
Radial drill, 30" Gang, plain.
Shaper, 32" Putnam.
Shaper, 24" Hollingworth bk. grd.
Shaper, 20" Steptoe.
Shaper, 16" Hollingworth, back grd.
Shapers, 12", 20" and 24" Juengst.
Turret lathe, 24" Gisholt horizontal.
Turret lathes, No. 4 B. & O., (2).

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Co., Inc., 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES.

- | | |
|-----------------------------------|----------------------------------------|
| 48"x16' bed lathe, compound rest. | 19"x 8' LeBlond, q. c. g., heavy duty. |
| 48"x16' Niles car wheel, m. d. | 18"x 8' Mueller, q. c. g., heavy duty. |
| 38"x18' Pond, triple geared. | 16"x 8' LeBlond, h. s. |
| 30"x14' Marshall & Hyschart. | 16"x 6' Prentice, h. s. |
| 27"x12' Pittsburgh, dbl. b. g. | 14"x 6' LeBlond. |
| 26"x16' Draper, triple geared. | 9"x40' Barnes, foot power. |
| 26"x10' 6" Walcott, q. c. g. | 14"x 5' American speed lathe. |
| 24"x16' 6" Johnson lathe. | 24"x11' American semi-auto. turret. |
| 20"x10' Mueller, h. s., c. r. | 22"x 8' Bullard turret lathe. |
| 20"x8' 6" Walcott, q. c. g., (3). | 14"x 5' Fox brass lathe. |
| 19"x10' LeBlond, motor drive. | Speed lathes, various sizes, (10). |

PLANERS AND SHAPERS.

- | | |
|------------------------------------|-------------------------------------|
| 27"x27"x8' planer, 1 head. | 20" Cincinnati b. g. crank shaper. |
| 30"x30"x9' Sellers, 1 head. | 20" G. & E. b. g. crank shaper. |
| 31"x36"x12' Pond, three heads. | 24" G. & E. b. g. crank shaper. |
| 72"x56"x12' Betts planer, 2 heads. | 26" G. & E. sgl. grd. crank shaper. |
| 16" Lodge & Davis shaper. | 26" Smith & Silk rack shaper. |

DRILLS AND BORING MILLS.

- | | |
|-----------------------------------------|-----------------------------------|
| Burke sensitive bench Nos. 0 & 1. | 38" & 40" New Haven drills. |
| 14" Rockford sensitive drill. | 4' Bickford radial, box table. |
| 12" Fulton sensitive bench drill. | Garvin 4 spindle drill press. |
| No. 3 Prentice port. rope drive drills. | 48" Niles car wheel boring mill. |
| 20" Silver, new, plain and bk. gd. | 36" Bridgeport boring mill. |
| 20" Foote-Burt mfrs. vertical. | 42" Bullard vertical boring mill. |
| 20" Barnes plain drill. | 76" Bullard vertical boring mill. |
| 24" New Haven plain drill. | |

HAMMERS AND MILLERS.

- | | |
|--------------------------|---------------------------------|
| No. 0 Owen plain miller. | No. 14 Kemp Smith plain miller. |
|--------------------------|---------------------------------|

PUNCHES, SHEARS, PRESSES AND ROLLS.

- | | |
|------------------------------------------------------------------|----------------------------------------------------------------|
| 50" throat Reade sgl. end punch and shear; massive construction. | 42"x14" Wais & Roos sq. shear. |
| 18" throat Rees s. e. punch. | No. 500 Toledo d. g. straight column trimming presses. |
| 18" throat Rees s. e. shear. | No. 56 dbl. housing knuckle press. |
| No. 6 Long-Allstatter s. e. punch and shear. | No. DG-76 Ferracute single acting. |
| No. 3-A Royersford single end punch and shears. | Straight-side punch press, 4' str. |
| 22" Bliss foot power sq. shear. | 300, 500 and 700 ton Mesta forging presses, 1500 lb. pressure. |
| | Toledo No. 365 gap rolling mill. |

MISCELLANEOUS.

- | | |
|-----------------------------------------------------------------------|-------------------------------------------------------------|
| Air compressor, No. 0 Au-To 3"x4". | Grinder, Western No. 10. |
| Air compressor, s. cyl. 3x5", belted. | Grinders, Plymouth Nos. 13, 14, 17, 20 and 23. |
| Air compressor, double cyl. 2 1/2"x4". | Grinder, 10" dbl. e. emery on column. |
| Air compressor, Ingersoll Sergeant Class "B" 10"x12". | Grinder, Russell 12" dbl. end bench. |
| Air compressor, Ingersoll-R. 6"x8". | Grinder, Barnes 20" wet tool. |
| Bender, Wallace No. 11 angle, hd. pr. | Grinder, 20" Ransom w.t., 250 y., d.c. |
| Bender, Hinman No. 1 Eye, hd. pr. | Grinder, twist drill, cap. to 2 1/2". |
| Blower, Root No. 3 Acme, hand. | Metal lockers, 10 sections. |
| Blowers, Buffalo Nos. 6, 8, 9 and 10. | Pipe machine, E. C. & B. 2 1/2" to 8", steam engine driven. |
| Blower, Sturtevant No. 7. | Polishing stand, Diamond No. 2. |
| Blower, Sturtevant No. 4 Monogram | Polishing stand, d. end, 42"x3" arbor. |
| Bolt cutter, 2" Acme, single head. | Polishing stand, Cuyahoga dbl. end. |
| Brazing table, all iron, 17"x23"x31". | Slotter, 14" Niles. 30" rotary table. |
| Chain belt, 16"x8"x1 1/2" p. and gear. | Tapping machine, No. 2 Garvin. |
| Cold saw, Gliem, 22" diam. 6" cap. | Upsetting machine, No. 3 Ajax. |
| Crane, 10" I-beam, 12'3" span, with Harrington 6,000 lb. chain hoist. | Vests, Forges, Pumps, Tanks. |

SECOND-HAND MACHINERY

FOR SALE BY

H. C. Marsh Co.,

Rockford, Illinois

LATHES.

16"x 6' Rockford lathes, (3), each.....	\$ 375.
Porter-Cable speed lathe.....	100.
Daniels single purpose lathes, (6), each.....	225.

FOR SALE BY

J. Bleser Mfg. Co.,

16th & Madison Sta., Springfield, Ill.

LATHES.

24"x12' Flather, 2 1/2 h. s., c. r.....	\$ 600.	16"x8' F. E. Reed.....	\$ 350.
L. M., h. s., c. r.....	400.	14"x6' Spring., taper attach.....	375.
18"x8' Barker, h. s., c. r.....	500.	7"x32" American, p. b. l.....	225.
18"x6' Barker, h. s., c. r.....	450.	7"x32" American, p. b. l., 6 collets	285.
17"x6' LeBlond, q. c. g.....	650.		

DRILL PRESSES.

Avey No. 1 1/2 h. s., 1 and 5 spd.....	\$ 115.	24" Rockford, b. g.....	\$ 175.
Demco No. 30, h. s., 95% new.....	165.	Moline No. 117, s. s.....	650.
10" sensitive.....	40.	34" W. F. Barnes, s. h.....	550.
14" sensitive.....	50.		

MISCELLANEOUS.

Band saw, metal, Thompson.....	\$ 175.	Press, Crosby, arch No. 59 B.C.,	
Bolt cutter, Acme dies 3/4 to 1 1/2.....	200.	2 1/2 stroke.....	\$ 325.
Bolt cutter, Acme 2 hds dies 1 1/2.....	275.	Screw mche, Smurr & Kamen,	
Grinder, 12x36 Landis, univ.....	1000.	1 1/16 capacity.....	300.
Pipe machine, 2" Jarecki.....	175.	Shaper, 12" Niles, tra head.....	250.
Press, R T Wood 400 ton, 4		Shaper, 24" Gould & E., c, s.....	500.
ram, hydraulic draw.....		Shears, Loy & Nawrath, 5' sq.,	
Screw machine, 2x26 P. & W.....	525.	cap. 14 gauge, 95% new.....	600.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

14"x 6' Flather, c. r., standard pat.....		18"x10' LeBlond, c. r. & t. a., 5-step	
18"x10' Springfield, c. r., 5-step cone.....		cone, (2).....	

TURRET LATHES AND SCREW MACHINES.

14" Lodge & Davis, plain head.....		18" Acme screw mche., p. f. to tur., (3).....	
14" Lodge & Davis, b. g.....		24" Davis turret boring and chuck-	
24" Lodge & Shipley g. f. h. turret		ing lathe, with forming rest.....	
lathe, 2-step cone, 6" belt, p. f. to		No. 1 Brown & Sharpe automatic.....	
turret, with air chuck.....		2" Hartford full automatic.....	

GRINDERS.

No. 10 Cochrane-Bly auto. bench		Type "DE" Hisey-Wolf internal.....	
saw filing machine.....		Rivett ball race grinder, with count-	
B Standard Diamond grinders, (2).....		ershaft.....	
No. 1 Warner & Swasey, cock.....			

RIVETERS.

11 1/2" throat Giant rivet spinner.....		No. 203 Giant rivet spinner.....	
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PUNCH PRESSES.

No. 11 Badger, hand.

MISCELLANEOUS.

Cold saws, 12" Burke, (2).....		Hack saws, Victor, power, (3).....	
Cold saw, Higley.....		Polishing stands, heavy, (2).....	
Filing machine, Simplex.....		Polishing lathes, City Machine Co.,	
Gear cutter, No. 2 Whiton auto.....		double end, (8).....	
Hammer, 25 lbs. Coffman post,		Polishing head.....	
power driven, c. s.....		Tapper, 3" Burke, bench.....	
Hack saw, Excelsior, power.....		Tapper, 1/2" friction vertical bench.....	

SECOND-HAND MACHINERY

FOR SALE BY

Fred. C. Dickow, - - - 1857 W. Lake St., Chicago, Ill.

TURNTABLE LATHE.

Pratt & Whitney 24x26", with cross feed turntable, geared head, quick change feed, good condition, real bargain, (2).

LATHES.

10"x3' motor dr., speed, (2).....\$120. 16"x6' Lancaster new.....\$490.
14"x6' Amtew new.....695. Ames precision bench, new, (2).....215.

DRILL PRESSES.

No. 0 Burke, new.....\$ 17. Avery high speed.....\$ 95.
Stecher floor drill, new.....61. 4 Spindle Hoefler p. fd.....350.

MISCELLANEOUS.

Cutter grinder, Peerless and Marvel power hack saws, grinder, machinists' vises, miller and planer vises, straightening press, electric grinders, folder, brakes, motors, drill and lathe chucks, index centers, etc.

FOR SALE BY

The Osborne & Sexton Machinery Co.,

Columbus, Ohio

LATHES.

9" to 13" Barnes, h. s., cp. r., new.
13-15-16 and 18 O. & S., h. s., c. r., new.
14"x 8' Monarch, hol. spdl., c. r.
18"x 8' Fitchburg, hol. spdl., cp. r.

TURRET LATHES AND SCREW MACHINES.

24" Steinle, 64" hol. spdl., grd. hd.
No. 2 W. & S. hollow hexagon.
4"x9" Garvin No. 1-SP.
4" Wells hand screw machines.
1" Garvin hand screw machine.

SHAPERS AND PLANERS.

14" Niles, traveling head.
16, 18 & 24" Barker, back gear crank.
22"x22"x 6' Gray, 1 head.

PRESSES.

No. 210 Stiles & Parker, 120,000 lbs.
No. 19 Bliss, b. g., fdg. att. 34" str.
No. 32-P Toledo, (2).
Perkins, dbl. crank, 16x24 bolster.

DRILLS AND RADIALS.

3' Morris plain, agl. pulley drive.
Henry & Wright agl. spdl., high spd.
34" Canedy-Otto plain, new.
44" Universal, cone drive.

MILLING MACHINES.

No. 2 Kempsmith plain, (2).
No. 25 Becker plain, (3).
Ames Lincoln type, 10"x40" table.
No. 12 Brown & Sharpe.
No. 4 Cincinnati universal.

GRINDERS.

No. 3 W. & M. wet surface.
6x18 Landis, plain.
Capital, internal, practically new.
Landis 10x24 universal.

MISCELLANEOUS.

Band saws, metal, 30" Wright, (2).
Boring mill, 12', 3 swivel heads.
Cold saw, Higley No. 114.
Compressors, 6x6, 8x8, 9x8 & 12x10.
Dynamo, plating, 2500 amp., 8 volt.
Furnace, oil tempering.
Furnace, lead or cyanide, 16" pot.
Gear cutter, G. & E. 36".
Gear cutter, Whiton 36"x34" face.

SECOND-HAND MACHINERY

FOR SALE BY

Crofoot Gear Works, Incorporated, 31 Ames St., Cambridge, Mass.

AUTOMATICS.

Cleveland automatic machines in good running order, sizes $\frac{1}{2}$, $1\frac{1}{2}$ and $2\frac{1}{2}$ (2).
Making room for new machines.

FOR SALE BY

Beaver Machine & Tool Co., Inc. - - - Newark, N. J.

Grinding machine, Heald No. 70 internal, with one extra head. This machine is almost new, having been used only about two hundred hours.
Keyseater, Davis No. 2 with complete assortment of cutters, etc. Excellent condition, almost new.

Make us an offer.

FOR SALE BY

E. B. Stickley Machinery Co.

Goebel Bldg., Detroit, Mich.

Drill presses, No. 3 Avery, 12" overhang, $1\frac{1}{2}$ " capacity, (2).
Forcing press, 30 ton, Lucas vert.
Gear shapers, 36" Fellows, (3).
Gear cutter, 2B Newark 24", s. & b.
Grinder, cylinder, No. 23 Brown & S.
Grinder, plain, 12x42 Landis.
Grinder, plain, 16x66 Landis.
Grinder, surface, No. 1 Diamond capacity 24x12x12".
Milling machine, No. 0 Rockford pl.

Milling mche., No. 8 Becker duplex,
Milling mch., slab type, 42"x42"x12"
Ingersoll.
Riveter, Hanna pneumatic, 1" cap.
Turret lathes, No. 24 Geo. G. Prentice semi-automatic, (2).
Turret lathe, No. 54 Geo. G. Prentice semi-automatic.
Turret lathes, 24" Steinel, grd. hd., (3).
Turret lathes, W. & O., B. & O., various sizes.

FOR SALE BY

Frank H. Parker Company,

First Nat'l Bank Bldg., Chicago, Ill.

Air compressor, dble cylinder
12"x16", 839 cu. feet, \$ 600.
Automatic Gridley, $\frac{1}{2}$ " cap., 1800.
Bend. roll, pwr., new, $\frac{1}{2}$ " cap. 50" l. 400.
Bend. roll, pwr., n., $\frac{3}{16}$ " c 74" l. 700.
Bend. roll, pwr., new, $\frac{1}{2}$ " cap. 62" l. 700.
Bend. roll, pwr., new, $\frac{1}{2}$ " cap. 74" l. 1150.
Bend. roll, pwr., new, $\frac{1}{2}$ " cap. 74" l. 1450.
Bend. roll, pwr., new, $\frac{1}{2}$ " cap. 86" l. 1700.
Bend. roll, pwr., new, $\frac{1}{2}$ " cap. 98" l. 2000.
Bending roll, hand, new, 18"x3" 25.
Bending roll, hand, new, 18"x1 $\frac{1}{2}$ " 17.
Bending roll, hand, new, 30"x3" 38.
Bending roll, hand, new, 36"x3" 45.
Brake, pwr., 8" cap. $\frac{3}{16}$ ", n.omo. 800.
Die heads, No. 4 and No. 6
Hartness self-opening, each 45.
Drill, Natco No. 22 mult., 24 sp. 1700.
Drill press, 28" New H., s. h., b. g. 250.
Drill press, 56" old time Niles 400.
Grinder, No. 60 Heald, used 3 m. 2200.
Grinder, No. 20 Oakly univ. comp. 800.
Grinder, No. 1 B. & S. univ. new 1300.
Hammer, helve, L. & A. 60 lb. cap. 400.
Hammer, steam, 250 lb. Morgan 250.

Hammer, steam, 600 lb. Morgan \$ 600.
Lathe, 12x5' Robins, h. s. p. r. & c. 125.
Lathe 18"x8' Old Timer, two chucks, s. s. p. r. 100.
Lathe, 20' x12' Pond, s. s. p. r., old timer 200.
Lathe, 25"x20' Lowell, c. r., s. s. 400.
Lathe, 25"x22' Niles, c. r., s. s. 800.
Lathe, 28"x15' New H., s. s. c. r. 400.
Miller, No. 3 Kempsmith plain, nearly new 1300.
Miller, old Garvin No. 4 400.
Miller, slab, table 20"x72" 800.
Planer, 20x20x5 New H., 1 hd. 200.
Planer, 24x24x6 Putnam, 1 hd. 400.
Planer, 32x32x10 Niles, 1 head 800.
Planer, 58x48x21 old type, as is 2000.
Press, No. 68N Bliss dbl. act. 700.
Screw mach., hand, No. 5 Foster 700.
Shaper, 24" Hendey old geared type, not a crank shaper 300.
Shear, No. 60 Quickwork rotary, 1" capacity, nearly new 8500.
Welder, spot, Federal type 444B, cap. 2-5/16" pieces 900.

SECOND-HAND MACHINERY

FOR SALE BY

Reliance Machinery Sales Co., 114 West Park Way, Pittsburgh, Pa.

Bolt cutters, 1" Acme, single and dbl.
Boring mill, Betts horizontal, 3" bar.
Die sinker, No. 2 Pratt & Whitney.
Drills, 20" Silver, new, (6).
Drills, 16" Canedy-Otto, new, (3).
Drills, 14" U. S. sensitive, new, (5).
Grinder, No. 70 Heald internal.
Grinder, No. 3 B. & S. univ. cutter & r.
Grinders, Yankee drill, all sizes, new.
Lathe, 16"x6" Blaisdell, plain change.
Lathe, 18"x8" Hamilton, c. r., p. c.
Lathes, 20"x8" L. & S., grd. hd., (2).
Lathes, 22"x10" Davis, d. b. g., q. c. g.
Lathe, 24"x12" Lodge & S., q. c. g., t. a.

Lathes, 30"x14" Pond, motor dr., (3).
Lathes, 18", 22" and 26" Libby.
Miller, No. 1 1/2 American plain, new.
Miller, No. 1 U. S., hand, new.
Miller, No. 4 Brown & S. univ.
Miller, No. 2 Cincinnati plain.
Planer, 12" Gleason, bevel gear.
Pipe machine, Williams, 3/4" to 2" inc.
Press, Loshbough-J. No. 3, new.
Presses, Willard No. 2-A, new, (2).
Presses, Willard No. 3-A, new, (2).
Shear, Schatz combination punch and shear, capacity 1"x4", size N-55.
Turrets, 24" & 28" Steidle and Gisholt.

FOR SALE BY

Herman L. Winterer,

949-53 N. Front St., Philadelphia, Pa.

LATHES.

32"x12" Pittsburgh, d. b. g., q. c. g.
31"x14" Niles.
28"x10" Niles, d. b. g., q. c. g., (2).
27"x12" Bridgeford, d. b. g., q. c. g., (2).
26"x11" Wickes, d. b. g., semi-q. c. g.
25"x14" LeBlond.
23"x10" Davis, d. b. g., q. c. g.

22"x 8" Hamilton, d. b. g., semi-q. c. g., (2).
21"x8" LeBlond.
20"x8" Walcott, d. b. g., q. c. g., (2).
19"x10" Draper, patent head.
18"x 7" Chard, d. b. g., semi-q. c. g.
And many others.

TURRET LATHES.

28" Pond, triangle.
Potter & Johnson, universal, 21" swing x 5" bed.
3x36" Jones & Lamson.
2x24" Jones & Lamson.
7"x14" Potter & J. semi-auto., (3).

No. 4 Warner & Swasey, Fox attach
No. 23 Garvin Monitor.
No. 3 Bardons & Oliver. (2).
1 1/2" h. s., 11" swing, Foster.
And many others.

DRILL PRESSES.

40" Barnes horizontal radials, (2).
36" Bickford radials, circular base, m. d., (2).
24" Barnes, geared head.
20" Barnes, geared head, (2).

18" 4-spd. adjust. Foote-Burt. (2)
12" 6-spindle Allen sensitive, (2).
12" 4-spindle Allen sensitive, (2).
Plain drills, all sizes.
Drill presses, assorted sizes.

MILLING MACHINES.

38"x6" Ingersoll horizontal slab.
No. 5 Cincinnati, table 9"x50".
No. 15 Garvin, table 12x41".
No. 15 Garvin, table 12x42".
No. 3 Becker Brainerd, table 12x40".
No. 2 Lodge & Davis universal.

Brown & Sharpe, 4"x28" universal table, (2).
No. 3 Garvin hand, horizontal.
12" Leland-Gifford vert. routing, (2).
Whitney hand miller.
And many others.

MISCELLANEOUS.

Bolt cutter, 2" Newton
Bolt cutters, 1 1/2" double head, (3).
Boring mill, 38" Beaman & Smith.
Boring mill, 31" Newton car wheel.
Grinder, disc, No. 17 Besly.
Grinder, 12x25" Bath universal tool and cutter.
Hammer, 400 lb. Merrill board drop, with Peck lift.
Hammer, 100 lb. Bradley helve.
Hammer, 100 lb. Merrill upright.

Hammer, 60 lb. Bradley helve.
Hammers, 60 lb. Belle, upright (2).
Keyseater, 24" stroke Baker Bros.
Keyseaters, 18" stroke, Morton, (2).
Keyseater, No. 1 Davis.
Punch presses, all sizes.
Riveter, 8 1/2" Wood hydr. gap.
Rolls, Kling angle bending, cap. 3/4".
Shaper, 36" Walcott.
Slotter, 10" Sellers.

Large assortment of General Machinery.

Send for complete list.

SECOND-HAND MACHINERY

FOR SALE BY

The Thompson Grinder Co., - - - Springfield, Ohio

Drill press, 14" Royersford Fdry. & Machine Co.	Lathe, 11"x5' Hudson Machine Co.
Lathe, 16"x8' Monarch Machine Tool Co.	Lathe, Jones & Lamson turret, 2"x24"

Can be inspected at our plant.

FOR SALE BY

A. A. McLaughlin & Company,

24 West Second Street, - - Cincinnati, Ohio

Air compressor, steam driven duplex, cylinders 10x12x14.....	\$1200.
Air compressor, McGowan steam driven, cylinder 5x5½.....	85.
Blower, Buffalo No. 8 volume B, 15" opening.....	65.
Lathe, 15"x8' Pratt & Whitney, hollow spindle.....	250.
Lathe, 17"x8' Steptoe McFarlan, solid spindle.....	250.
Lathe, 16"x5' Buckeye turret lathe.....	95.
Motor, Hobart, 10 h. p., d. c.....	185.
Planer, metal cutting, 28"x28" Putnam.....	600.

FOR SALE BY

The Enterprise Machinery Co.,

28 S. Clinton St., Chicago

Drill, 26" Aurora b. g.	Lathe, 11"x8' Rockford, power cross feed, chuck, compound rest.
Drill, 3-sp. Rockford, ½" s.h., p.f., k.o.	Lathe, 14"-24"x5 Barnes, dr. gap, all parts fine condition, 12" new ck.
Drill, Avey high speed.	Punch press, 120 lb. 11" wheel, auto. stop, capacity 4"x1-16", new.
Drill, Cleveland 28" dbl. b. g., new.	Riveters, Schuster ½"; Grant ¾".
Drill, Cleveland 32" single back gear, new.	Screw machine, auto. Acme No. 54, many tools.
Grinder, B.&S. No. 1 cutter & reamer.	Slotter on pedestal, with vise, \$60.
Grinder, sur., moving table 8"x15".	Tube cutter, power, Fox, \$25.
Lathe, 32"x14' Putnam, 50" rais. blks.	
Lathe, 24"x10' Am. q. c., dbl. b. g.	
Lathe, 32"x16' Fifeild, gra., 42" blks.	

FOR SALE BY

H. D. Warner,

57 May St., Hartford, Conn.

Air compressors, Chicago Pneumatic, 750 cu. ft. capacity, (2).	Chucking mche., No. 33 New Britain.
Automatic, 3½" Gridley sgl.-spindle.	Drill press, 3-spindle.
Automatic, 1½" Cleveland.	Drill press, 4-spindle.
Automatic, 4½" Cleveland.	Milling machines, No. 2 P. & W. Lincoln type, (5).
Automatics, 2½" Gridley mult.sp., (5).	Milling machines, No. 12 P. & W. Lincoln type, (6).
Automatics, 2½" Cleveland, (3).	Milling machines, 12" Light P. & W. automatic, (20).
Automatics, 3½" Cleveland, (2).	Milling machines, Briggs type A, (4).
Automatics, No. 1 Chicago, ½" cap., (2).	Press, Toledo No. 55.
Automatics, 2½" Gridley sgl.-sp., (20).	Press, No. 59½ Toledo reducing.
Automatics, Hartford, all sizes from 1½" to 2" (15).	Press, Bliss No. 79½ tie-rod type, 10" stroke.
Broaching mchs., No. 1 Lapointe, (5).	Shear, alligator, capacity 2" sq., cold.
Bulldozer, No. 4 W. & W.	Turret lathe, P. & W.
Car wheel boring and turning machines, Niles 42".	Turret machines, No. 4 Foster, (5).
Chucking machine, No. 6 W. & S., ch.-ing attachment.	

SECOND-HAND MACHINERY

FOR SALE BY

Girard Machine & Tool Co., 491-493 N. Third St., Philadelphia, Pa.

Engine lathe, 37 $\frac{1}{2}$ "x23" I. H. Johnson, triple geared and geared face plates, with two sets of raising blocks 49" to 61".
 Engine lathe, 28"x12" Fitchburg, double back geared, 7' between centers.
 Engine lathes, 26"x13" Wickes, double back geared, heavy duty, q. c. (2).
 Engine lathes, 26"x10" Bridgeport, d. b. g., q. c., 4' centers (2).
 Engine lathe, 21"x11" Lodge & Davis, taper attachment, 7' centers.
 Engine lathes, 20" x 8' Lodge and Shipley, d. b. g., q. c., 4' centers, (2).
 Engine lathe, 18"x8" Lodge & Shipley d. b. g., q. c., tap. att., 4' centers.
 Engine lathes, 18"x 8' American, d. b. g., q. c., heavy duty, (12).
 Engine lathe, 18"x 8' Milwaukee, d. b. g., q. c., heavy duty.
 Engine lathes, 17"x6" LeBlond, d. b. g., q. c., heavy duty, (10).
 Lathes, 12", 14" and 16" quick change, with various size beds.
 Grinder, No. 1 Cincinnati, univ. cutter and reamer, standard equipment.
 Grinder, No. 2 Bath universal cutter and reamer, with standard equipment.
 Grinder, No. 2 Brown & Sharpe universal cutter & reamer, standard equip.
 Planer, 24"x24"x5' Pond planer, one head.
 Shapers, 20" Kelly, 16" Gould & Eberhardt, 24" Barker, b. g., late type.
 Turret lathes, 2x24 Jones & Lamson, bar equipment; 21" and 23" Gisholt.

Large lot of Screw Machines, Drill Presses, Punch Presses, etc.

Send for our List.

FOR SALE BY

A. D. White Machinery Co., - 108-114 N. Jefferson St., Chicago

ENGINE LATHES.

18"x 7' Chard, d. b. g., p. c.	24"x10' Putnam.
18"x 8' Bell, d. b. g., p. c.	28"x 8' Prentice, d. b. g., p. c.
18"x10' Reed.	30"x10' Pond.
20"x 8' Reed.	34"x10' Putnam.
20"x 8' Boye-Emmes, d. b. g., q. c.	38"x14' Fifeid.
22"x10' Davis, d. b. g., q. c.	

MILLING MACHINES.

Briggs type A. (2).	No. 5-B Becker vertical.
No. 1-Y Brown & Sharpe.	Newton slab, table 13"x65".
No. 6 Brainard, Lincoln.	Ingersoll slab, 22"x5'.
Model AB Becker, vertical.	

TURRET LATHES AND SCREW MACHINES.

No. 3 Foster, plain head.	No. 3 Stecher, hand, (6).
20"x5' Bridgeport, (2).	7/16" Cleveland, ratchet feed.
20"x8' Fay & Scott universal.	1" Cleveland, semi-auto.
22"x5' Reed.	1" Cleveland, friction.
21" Gisholt.	1" Cleveland, friction.
24" Gisholt, big bore.	1" Cleveland, jigger.
3x26" Jones & Lamson.	1" Hartford, (2).
16"x5' Dreses Fox Monitor.	1" Cleveland, jigger.
18"x8' American Fox monitor.	11" LaVigne.
18"x8' Springfield Fox monitor	No. 1 Brown & Sharpe, 4" cap., (3).
No. 1 Garvin, hand, (6).	

DRILLING MACHINES.

36" Mueller plain radial. 42" Miles plain radial.

PUNCHES AND SHEARS.

19" throat geared punch. No. 37 Williams & W. gang punch.

MISCELLANEOUS

Bolt cutter, 14" double hd., Adams.	Hammer, 500-lb. Sandage.
Blower, No. 7 Sturtevant high press.	Oil gas generator, No. 3 American.
Gas engine, 35 h. p. Columbus.	Profiler, 2 spindle Putnam.
Gas engine, 55 h. p. Bruce McBeth.	Saw, No. 54 Nutter-Barnes.
Grinders, No. 3 Woods tool & cutter	Shaper, 16" Gould & Eberhardt.
Grinder, Springfield, 2-wheel water.	Shaper, 20" Hamilton.
Grinder, Leland & F., water.	Tube cutter, No. 3 Fox.

We Have For Sale in Our Warehouse

15 Briggs High Duty Milling Machines

Type "A", Made by Gooley & Edlund

Used three to six months in the manufacture
of light gun parts

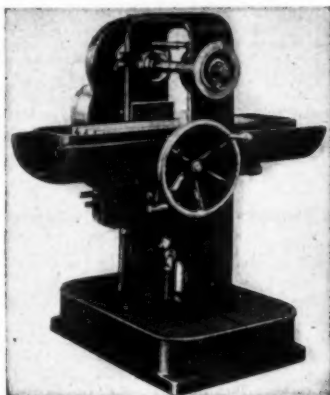


Table traverse.....	16".
Size of table.....	24x8.
Between housings.....	12 3/4".
Taper of arbor No. 11 Brown & Sharpe.	
Maximum distance, table to arbor.....	12".
Feed changes.....	eight.
Floor space.....	42x52.
Weight.....	2300 lbs.

PRICE, each.....\$400.
less 10% in lots of six.

J. L. LUCAS & SON, Inc.
No. 3 Fox Street, BRIDGEPORT, CONN.

Heavy Lathes For Sale

We have just bought 20 Heavy Lathes which we are now overhauling and will sell at fair prices

1-36"x10'	Putnam Geared Face Plate Lathe, compound rest, screw cutting, no tailstock, fine condition, at	\$ 1000.
1-28"x13'	Niles-Bement-Pond heavy duty, compound, taper, p.c.f., very modern and fine condition	1750.
1-26"x12'	Putnam h. s., compound, overhauled and complete, at	600.
24"x10'	Reed & Putnam and	
20"x10'	and 12' Putnam. We have several, let us know what size and we will pick one out and send you the photo and particulars.	
1-24"x20'	Niles, compound, taper, h. s., and complete, 15'6" between centers, fine order, at	1250.
1-20"x8½'	Roulsted, double b. g., compound, 2" h. s., excellent condition and as good as new, at...	700.

Hendey Lathes

1-20"x10'	Hendey, tie bar, oil pan, compound and taper attachment.....	\$ 1800.
1-16"x 7'	Hendey, tie bar, taper and compound.....	900.
3-16"x 6'	Hendey, compound, taper, oil pan bed.....	800.
1-16"x 6'	Hendey, compound, oil pan.....	750.

Big Presses for Sale

- 1-No. 3½ Bliss Cam Drawing Dbl. Action, good order...\$ 2000.
- 1-300 ton and 800 ton Toggle Embossing Presses.

Send for complete list No. 52 with prices and tell us your wants.

J. L. LUCAS & SON, INC.

3 Fox St.,

BRIDGEPORT, CONN.

FOR SALE

completely equipped

Foundry and Machine Shop

**Now in operation in the Southern part of Illinois
in the heart of the Coal Mining District**

**Excellent opportunity to continue business,
which will bear investigation**

Full details on request

Vonnegut Machinery Co.
Indianapolis, Ind.

For Sale

From the Equipment of
The R. K. LeBlond Machine Tool Co.

- | | | |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| No. 1 | 54"x54"x30" Betts Heavy Duty Planer,
2 Heads, 25 H. P. Triumph Motor, E.
C. M., Reversing Controller, 220 V.
D. C. Direct Connected. Thoroughly
modern and in Excellent Condition. | \$7500. |
| No. 2 | 3 3/4" Four Spindle National Acme Auto-
matic, practically new, not used 2 months | 4000. |
| No. 3 | 1 Queen City Machine Tool Co. Plain
Cylindrical Grinder, Capacity 16"x36",
with radius grinding attachment. Used
very little..... | 1600. |
| No. 4 | 1 Gisholt Tool Grinder..... | 250. |
| No. 5 | 1 No. 6 E. Fox Wood Trimmer..... | 45. |
| No. 6 | 1 Band Saw Filing and Setting Machine | 25. |
| No. 7 | 1 Hand Oil Grooving Machine..... | 75. |

These tools can be inspected in our plant

The R. K. LeBlond Machine Tool Co.
Cincinnati, Ohio

Good Used Tools

We offer the following used machine tools. Further particulars gladly given on receipt of request. We have facilities for overhauling used machinery and aim to offer only trustworthy machines.

BORING MACHINES.

Bement-Miles horizontal, 2 $\frac{1}{2}$ ' bar, 20x30 cross table.
No. 2 Beaman & Smith horizontal boring machine. 4" dia. spindle, 62" traverse of head, $\frac{1}{2}$ h p. Reliance motor, 2 h p head elevating motor

DRILLING MACHINES.

No. 1-1 spindle Avey, bench (23).
No. 2-2 spindle Avey.
23" Rockford sliding head.
24" Mechanics sliding hd., b.g. p.f.
42" Cincinnati-Bickford sliding hd., cone drive
26" Barnes sliding hd. b.g., p.f. (3).
42" Bickford plaid radial. tapping attachment.
3' Gang pt radial, tapping, pl. table
5' Lengthened to 6' Prentice Bros plain radial.
No. 1 Bickford plain radial, tapping gear box belt drive, box table.
6-sp. Hendey power feed to each spindle.
16-sp. Bausch drill, 1 $\frac{1}{2}$ " spindles.

GRINDERS.

No. 4 12x60 Landis universal.
No. 2 Oakley univ. cutter and tool.
No. 1 Norton cutter and tool.
No. 11 Rivett, oscillating
No. 70 Heald internal.
No. 1 Hartford auto. surface
No. 5 Rivett hand feed oscillating.
Garrigus rotary surface (8).
20" Bealy disc (2)
No. 16 Blanchard high pwr. vertical surface, 30" mag. chuck, 220 v. d.c.
No. 34 Van Norman internal with water att. (2)
20x2 Taylor & Fenn.
20" Taylor & Fenn wet tool, (9).
Pratt & Whitney vertical surface.
Reed Prentice surface.

LATHES.

16x9 Lehmann. q. c. taper, oil pan.
18x8 Perkins.
18x10 Robbins.
18x8 Prentice Bros., geared head, single pulley drive, q.c., c.r., p.c.f., oil pan, chuck fitted.
16x8 Cincinnati. q. c., d. b. g.
21x8 Lodge & Davis, 2 chucks.
22x8 Schumacher-Boye, chuck.
26x12 Putnam. c. r., d. b. g.
44x16 Putnam, single back grs., c.r., p.c.f., s.r., 4" raising blocks.
56"x24" Wood & Light, b.g., c.r., p.c.f.
38x20 New Haven, steady and fol. lower rests, change gears.

MILLING MACHINES.

No. 14 Garvin plain, (4).
No. 14A Garvin plain. (7).
No. 15 Garvin plain.
No. 1 $\frac{1}{2}$ LeBlond univ., motor dr.
No. 2 Owen plain.
Type A Briggs plain.
No. 3 Hecker vertical.
No. 1 Steptoe plain.

SCREW MACHINES.

1-15/16 Garvin wire feed.
2x24 J. & L. flat turret, cone dr., (3)
No. 2 $\frac{1}{2}$ Garvin single geared wire feed, (2).
24" Gisholt turret.
24x10 Lodge & Davis, oil pan. power feed to turret.
20" J & L. geared head spindle chucking equip. 4 $\frac{1}{2}$ " hollow sp.

MISCELLANEOUS.

Gear cutter, No. 4 B. & S. auto.
Planer, 24x24x6 Flather.
Planer, 24x24x6 Putnam.
Planer, 36x36x8 Pond.
Screw machine, 4-spdl. auto. No. 515
National Acme, arranged for motor.
Shaper, 15" Hendey motor driven.
Shaper, 24" Hendey motor driven.

Henry Prentiss & Company

Incorporated

149 Broadway

New York

The Certainty of a Scarcity of Machine Tools This Year Makes This Lot Important to All Shops

LARGE LATHES (Used)	54" Swing, 21' bed, Pond, Triple-gearcd.
	36" Swing, 16' bed, Putnam, Triple-gearcd.
(New)	28" Swing, 30' bed, Quick-change, Taper.
	36" Swing, 18' bed, New Quick-change.
ABSOLUTELY THE LARGEST STOCK OF NEW QUICK-CHANGE LATHES IN THIS COUNTRY FOR IMMEDIATE SHIPMENT.	36" Swing, 16' bed, New Quick-change.
	32" Swing, 20' bed, New Quick-change.
	32" Swing, 18' bed, New Quick-change.
	32" Swing, 16' bed, New Quick-change.
	29" Swing, 20, 18 & 16' beds, New Qk.-ch.
	21" Swing, 10, 12 & 14' beds, New Qk.-ch.
	18" Swing, 10, 12 & 14' beds, New Qk.-ch.
	16" Swing, 6, 8 & 10' beds, New Qk.-ch.
RADIAL DRILLS (New)	25 in stock for immediate shipment of the following sizes—2½, 3, 3½ & 4' arms—all with Spd.-box and sgl. Pulley Dr., T. a., etc.
SLOTTERS	3—"Niles-Bement-Pond" Latest Heavy Pat-
24-in. stroke	tern Slotting Machines, each 24" str., complete Mot.-dr., including, Mot., D.C. 220 V.--built last year and will be sold at half the cost new.
GRINDERS	Universal, Surface and Roll Grinders.
MILLING MACHINES	No. 3 Cincinnati, also Brainerd & Newton, Pl.
TURRET LATHES	Gisholt, Jones & Lamson, Pond, and P. & J.
BOILER-SHOP TOOLS	Bending Rolls, 14' Bet. Housings, Wickes. Horizontal Punch, 60" Tht., Hilles & Jones. New Vertical Punches, 30 and 50" throats. Hydraulic Riveting Equipment 8' gap.
BORING MILLS	37" Swing, Baush, also 36" Brown & Sharpe.
PIPE MACHINES, 6"	MULTIPLE DRILL. Four-spindle, Cutting-off Machine—Bolt Machines, etc.

Write for our complete list of entire stock of New and Used Tools in stock--at our own Jersey City Warehouses. Many of these Tools now on hand are never found outside of McCabe's stock.

J. J. McCabe Lathe & Machinery Corp'n
149 Broadway - - - - NEW YORK

New Machinery For Sale

In Stock at Chicago and New York

Lathes

26"x12' Wickes, q. c. g., d. b. g.
24"x13' Chard, q. c. g., d. b. g.
24"x10' Advance, q. c. g., d. b. g.
20"x11' Chard, q. c. g., d. b. g., (2).
20"x 9' Chard, q. c. g., d. b. g.
20"x10' Wickes, q. c. g., d. b. g.
18"x 8' Whitcomb-Blaisdell.
16"x10' q. c. g., d. b. g.
16"x 8' Cisco, q. c. g., d. b. g.

16"x 7' Chard, q. c. g., d. b. g.
16"x 6' Cleveland tool room, (3).
14"x 8' Cisco, q. c. g., d. b. g.
14"x 6' Cisco, q. c. g., d. b. g.
14"x 6' Amtew, d. b. g.
12"x 5' 6" Davis tool room, (2).
12"x 4' 6" Cleveland precision.
6"x30" and 6"x36" Dalton bench.
Full line, Rivett precision bench.

Drilling Machines

4 1/2' Morris plain radial.
4' Western plain radial.
3 1/2' Canedy-Otto radial, (3).
3' Wisconsin sensitive radial.
36" Snyder traveling head.
32" Cleveland sliding head, (3).
30" Snyder traveling head.
28" Cleveland sliding head, (3).
28" Snyder traveling head.
25" Snyder, with tapping attach.
23" Cleveland upright.

23 1/2" Cleveland, upright.
23" Snyder upright, (2).
22 1/2" Cleveland upright, (3).
21" Cleveland upright, (8).
20" Milwaukee, upright, (2).
20" Wisconsin, all-gear, (2).
20" Canedy-Otto, upright, (4).
1. 2 & 3 spdl. Demco, h. s., b. b.
2-spdl. Detroit, h. s., b. b.
Belt and motor driven bench.
Portable electric.

Milling Machines

No. 2 Cleveland universal, (4).
No. 2 Cleveland, plain, (2).
No. 1 Cleveland universal.
No. 1 Cleveland plain.
No. 3 Becker vertical.

No. 2-A Fox universal.
No. 2-B Fox plain, (3).
Nos. 1-A, 1-B and 0-B Fox plain.
No. 1 U. S. hand miller.
Nos. 2 and 3 Burke bench.

Grinders

No. 3 Modern universal, (2).
No. 2 Wilmarth & M. surface, (2).
24" Milwaukee wet tool.
10"x32" Ott universal.
No. 103 Rivett internal.
No. 2 Reid surface.

No. 1 Norton cutter and tool.
Yankee drill—various sizes.
Grand Rapids drill—various sizes.
Partridge floor stand.
Portable electric.

Shapers

24" Milwaukee heavy duty.
20" Mattison heavy duty.
20" Milwaukee heavy duty.

18" Barker.
16" Milwaukee.
16" Ohio.

Miscellaneous

Arbor presses, Atlas, all sizes.
Filing machines, Nos. 2 & 3 Barry.
Hack saws, Peerless, all sizes.

Planer, 36x30x8' Gordon.
Punch press, No. 19 Bliss.
Punch press, No. 19 1/2 Bliss.

USED MISCELLANEOUS

Boring mill, 60" Bullard, 2 heads.
Cold Saw, No. 15 Lea Simplex.
Lathe, 14"x5' Drees Monitor.

Lathe, 24" Steidle turret.
Miller, No. 1 Farwell.
Shaper, 16" Smith & Mills.

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Drills

- 12—Meyers Sensitive Bench Drills with chucks.
- 12—Meyers Sensitive Floor Drills complete.
- 1—20" Snyder Drill, wheel and lever feed
- 1—20" Hamilton Drill back gear and power feed.
- 1—No. 4 Baush 16-Spindle Multiple Drill

Grinders

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> 2—Walker surface complete with Magnetic Chucks. 1—No. 2 LaSalle Automatic Surface. 1—No. 1 LaSalle Plain and Surface. 1—No. 3 LaSalle Plain and Surface. 1—Hartford Automatic Surface. 1—Norton Tool Grinder, complete 1—Wilmarth & Morman Drill Grinder, Style P O., complete. 1—Milwaukee Wet Tool 18" wheel. 1—Chicago Wet Tool, 18" wheel. 1—No. 1 St. Louis, self-contained c.s. 1—No. 2 St. Louis, self-contained c.s. 1—No. 3 St. Louis, self-contained c.s. 1—No. 4 St. Louis, self-contained c.s. 1—No. 5 St. Louis, self-contained c.s. 1—No. 6 St. Louis, self-contained c.s. 1—No. 1 St. Louis, pull countershaft 1—No. 2 St. Louis, pull countershaft | <ul style="list-style-type: none"> 1—No. 3 St. Louis, pull countershaft. 1—No. 4 St. Louis, plain countershaft. 1—No. 5 St. Louis, plain countershaft 1—No. 6 St. Louis, plain countershaft 1—No. 7 St. Louis, plain countershaft 1—No. 0 Western Grinder, complete. 1—No. 1 Western Grinder, complete. 1—No. 2 Western Grinder, complete. 1—No. 3 Western Grinder, complete. 1—No. 4 Western Grinder, complete. 1—No. 5 Western Grinder, complete. 1—No. 7 St. Louis Polishing Machine, t & l pulley 1—No. 7 St. Louis Polishing Machine, with countershaft 1—No. 10 St. Louis Polishing Machine complete 1—No. 4 Western Polishing Machine, complete. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Lathes

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> 1—11"x5' Meyers, complete. 1—14"x4' Pratt & Whitney, complete. 1—14"x6' Prentice complete. 2—16"x6' Hamilton, complete. | <ul style="list-style-type: none"> 1—16"x7' Union, complete. 1—16"x8' Hamilton, complete. 4—18"x8' Greaves-Klusman, comp. 1—26"x10' Fitchburg, complete. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Milling Machines

- 1—No. 3 Brown & Sharpe Plain Milling Machine, complete with Heavy Vertical Attachment, (New).
- 2—No. 2 Rockford Plain Millers, complete, (New).
- 1—No. 14 Garvin Plain Miller, complete.
- 1—No. 1 Dow Plain Miller, complete.
- 1—No. 20 Oesterlein Plain Miller, complete.

Shapers

- | | |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> 1—16" Hendey Friction Shaper. | <ul style="list-style-type: none"> 1—16" Whipp Crank Shaper, (New). |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------|

Miscellaneous

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> 1—No. 3 Nicholson Arbor Press on Stand, with drivers. 7—No. 00 Errington Tapping Chucks. 1—No. 1 St. Louis Tapping Chuck. 1—No. 2 St. Louis Tapping Chuck. | <ul style="list-style-type: none"> 1—No. 3 St. Louis Tapping Chuck. 1—No. 4 St. Louis Tapping Chuck. 1—No. 5 St. Louis Tapping Chuck. 1—No. 2 Hilles & Jones horizontal punch, cap 4" in 1", 8" depth of tht. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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GUARANTEED BARGAINS

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- 1—No. 72 National Acme Cutting-off Machine.
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- 1—4" Drees Radial Drill.
- 1—36" Bickford Back Geared Drill Press.
- 1—No. 12 Modern Grinding Machine.
- 1—12x36 Landis Plain Grinder.
- 1—24" Whiton Automatic and 24x6 G. & E. Gear Cutters.
- 1—each 24"x36" Fellows Gear Shapers.
- 1—Safety Emery Wheel Grinder, Planer Type.
- 1—No. 1 Landis Universal Grinder.
- 1—No. 3 Heavy Brown & Sharpe Automatic Gear Cutter.
- 1—No. 5 Brown & Sharpe Automatic Gear Cutter.
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- 1—Prybil Spinning Lathe.
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- 2—18x8' Reed-Prentice Lathes.
- 1—22x10' Lodge & Shipley Lathe.
- 1—24" Pratt & Whitney Turret Lathe.
- 1—each A. B. & No. 3 Becker Vertical Milling Machines.
- 1—No. 3 Lees-Bradner Thread Miller.
- 1—20x17 Oesterlein Milling Machine.
- 1—25 Becker Horizontal Milling Machine.
- 1—No. 17 William & White double punch and shear.
- 1—30x30x8' Pond Planer.

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- 1—Milwaukee No. 1½ Universal Milling Machine.
- 1—Milwaukee No. 1-B Universal Milling Machine.
- 1—Kempnith No. 2 Universal Milling Machine, Cone Driven.
- 2—Brown & Sharpe No. 3-A Heavy Universal Milling Machines.
- 1—Pratt & Whitney Tool Room Lathe 12"x6', c. r., Relieving Attach.
- 1—Davis 16"x8' Quick Change Gear Lathe.
- 1—Bradford 16" Quick Change Lathe, Taper Attach., Relieving Attach.
- 1—Barnes 26" Sliding Head Upright Drill.
- 3—No. 3 Foster Hand Screw Machines, Geared Friction Head, Wire Feed, Automatic Chuck, power feed to the turret.

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- 1—10x36" Thompson Full Universal Grinder.
- 1—No. 2-A Landis 16x32 Universal Grinder.
- 1—No. 2 Manhattan Surface Grinder, (new).
- 1—Grand Rapids Drill Grinder, ½" to 2½" capacity.
- 1—No. 2 Woods Universal Cutter and Tool Grinder.
- 1—No. 2 Oakley Universal Cutter and Tool Grinder, (new).

Shapers

- 3—16" Whipp S. G. Crank Shapers, (new).
- 2—20" Ohio B. G. Crank Shapers, (new).
- 1—Each 16, 18, 21 and 24" Hollingworth Bk. Geared Crank Shapers, (new).
- 1—20" Ohio back gear shaper.

Millers

- 2—No. 2½ American Plain Millers, (new).
- 1—No. 2 American Plain Miller, (used).
- 1—Each Nos. 2-B and 2 Rockford Universal Millers, (new).
- 1—No. 0 Bickett Vertical Miller and Profiler.
- 2—No. 1 U. S. Hand Millers.

Lathes

- 1—24" Gisholt Turret, chucking equip., taper att., rapid traverse, (modern).
- 1—26"x164" Solid Spindle, Back Gear, Compound Rest, Engine Lathe.
- 1—16"x6" Jones & Lamson Engine Lathe, hollow spindle, complete with plain rest, countershaft, face plate, wrenches, etc.
- 1—17"x8" Perkins Engine Lathe, hollow spindle, complete with plain rest, countershaft, face plate, wrenches, etc., in first-class operative condition.
- 1—Each Sidney Medium Pattern Lathes, 14, 16, 18, 20" by 6, 8, 10' beds, 3-step cone, d. b. q. c. g.
- 1—Each Sidney Heavy Duty Lathes, 15, 17, 19, 25, 27" x 6, 8, 10, 12, 14' beds, 3-step cone, d. b. q. c. g.
- 1—14"x6" Flather Lathe, p. r., h. s.

Miscellaneous

- 1—No. 6 Quickwork Rotary Shear, 48" throat, 1" cutting capacity.
- 1—24"x24"x6" Gray Planer, one head on cross rail.
- 1—26"x24"x6" Pond Planer, 2 heads.
- 1—No. 2 Royersford Double End Punch and Shear, 7½" throat, cap. 7"x½".
- 2—No. 7 Long & Allstatter Punch and Shears, approx. 5" throat, cap. 7"x½".
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Bliss No. 8 bench power, with
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Cincinnati No. 3 universal.

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Becker Brainard No. 2 pl., g. box.

Garvin No. 13 plain.

Standard No. 1 hand & weight fd.

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Reed, 20"x14', complete equip.

Reed, 18"x12', taper, etc.

Reed, 20"x10', oil pan, etc.

Hendey, 14"x 6', q.c.g. taper, etc.

Hendey, 18"x12', q.c.g. taper, etc.

About 15 others.

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Boring mill, 3" bar Niles, horiz., grd., complete, excellent condition.

Planer, 30x30x8' Woodward & Powell, 2 heads.

Planer, 42"x42"x14' Betts, 2 heads, motor drive.

Planer, 48"x48"x16' Betts, 4 heads, motor drive.

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18"x7' Monarch, 95%, (2).....	750.	60x24 } motor or cone drive.	
18"x8' South Bend, 95%, (6).....	550.	60x30 }	
20x8 L. & S., q. c., d. grd. hd., 90%	1250.	96x24 cone drive.....	
		96x30 cone drive.....	

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14x6 Porter Lathe.
18x12 Reed Lathe.
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No. 3 Niagara Press.
37 Niagara Press.
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Whitney Hand Mill.
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- 21-18"x 8' Boye & E., d. b. g., c. r.
- 8-18"x 8' Boye & Emmes, dbl. bk. grd., comp. rest qk. ch. grd.
- 18-18"x 8' LeBlond, dbl. bk. grd., comp. rest, qk. ch. grd.
- 65-19"x 8' LeBlond, dbl. bk. grd., comp. rest, qk. ch. grd.
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- 16-20"x 8' American, dbl. bk. grd., comp. rest, qk. ch. grd.
- 112-20"x 8' American, dbl. bk. grd., comp. rest, qk. ch. grd.
- 58-21"x 10' LeBlond, dbl. bk. grd., comp. rest, qk. ch. grd.
- 10-25"x 10' LeBlond, dbl. bk. grd.,
- 33-26"x 10' Niles, d. b. g., c. r., q. c. g.
- 3-26"x 12' Putnam, motor driven, comp. rest, qk. ch. grd.
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- 30-26"x 12' Bridgeford double back grd. comp. rest, qk. ch. grd.
- 16-26"x 14' Bridgeford double back grd., comp. rest, q. ch. grd.
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- 5-28"x 20' Bridgeford double back grd., comp. rest, qk. ch. grd.
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- 3-30"x 15' American geared head comp. rest, qk. ch. grd.
- 3-30"x 20' American geared head comp. rest, qk. ch. grd.
- 4-40"x 12' Fifield trip. gd., c. r.

- 23-32"x 12' Pittsburgh double back grd. comp. rest, qk. ch. grd.
- 4-40"x 18' Fifield trip. gd., c. r.

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- 1-No. 20 Ohio universal.
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- 1-No. 2-A Garvin plain.
- 2-No. 3 Cincinnati plain.
- 1-No. 3 LeBlond universal.
- 1-No. 4 Becker-Brainard univ.
- 1-Type B Briggs miller.

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- 14-3-A Warner & Swasey.

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- 4-4B Henry & Wright.
- 3-6B Henry & Wright.
- 1-3' Fosdick Radial.
- 2-6' Bickford Radial.

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- 1-No. 2 Nazel Forging Hammer.
- 2-No. 3B Lapointe Broaching.
- 4-6"x 12" P. & W. Thread Millers.

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- 1-No. 6 Ditto single end.
- 1-No. 2 Wilmarth & Morman Surface Grinder.
- 3-No. 6 Whitney Hand Milling Machines.
- 1-Max Ams No. 1245 Dbl. Action Press with roll feed.
- 1-No. 68C Bliss Double Action Press.
- 1-Similar size Bliss Double Action Press, bolster 11x21.
- 1-Similar size Farrell Dbl. Action Press, bolster 14x23.

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- No. 35 Landis Floor Type HORIZONTAL BORING, DRILLING AND MILLING MACHINE. 3½" Bar.
- 12" Niles VERTICAL BORING MILL. (Widened Pattern).
- 84" x 18' Industrial Works LATHE.
- 14000 lb. Morgan Dbl. Frame STEAM FORGING HAMMER.
- No. 5 Blakelee BU¹ LDOZER. (Similar to No. 4 Williams & W.).
- LEES-BRADNER EXTERNAL THREAD MILLER.
- 2¼" Gridley Multiple Spindle AUTO. SCREW MACHINE.
- 6" x 60" LO-SWING LATHE.
- 10" x 50" Norton PLAIN GRINDER.
- 14" x 50" Norton PLAIN GRINDER.
- 30" Morton DRAW CUT SHAPER.

*Also complete machine shop equipment
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EXCEPTIONAL OPPORTUNITY

THIRTY
8" BY 60"
LO-SWING
LATHES

Single Pulley Drive

SPECIAL PRICE ON FIVE OR MORE

These machines were purchased in 1918 and were used only a short while on Liberty aircraft engine work. They are in first-class condition in every respect.

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THE NOTCH & MERRYWEATHER MACHINERY CO.

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CINCINNATI

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Last Call—Going Fast

16 Brown and Sharpe No. 12

30 Briggs, Type A

35 Whitney No. 6

36 P. & W. No. 2 Lincoln

P. & W. Thread Miller, internal

Machinshop Equipment Corp.

170 Oliver St., Boston, Mass.

BENNETT BARGAINS

Planers

18-22-26-30-32-42-54-60" between housings; 1-2-3-4 heads.

Vertical Boring Mills

30", 36", 40", 51" and 75".

Horizontal Boring Machines

24", 3", 4"; also 5" Barrett type.

Radial Drills

2½' and 4'—Plain and Universal.

Upright and Multiple Drills

12"-20"-24"-36" and 42"; also 2, 3 and 6 spindle.

Lathes

Various sizes from 14" to 102" swing, 6' to 22' beds.

Turrets

2x24", 3½", 20x6", also 20", 28" and 34".

Milling Machines

48x36x14' Ingersoll 4 heads; 20"x7' Brainerd Slab; No. 3 Newton Duplex; No. 24 Garvin vertical; No. 2 H. & J. vertical; Nos. 4 & 5 B. & S. Plain; No. 2 Plain L. & D; others.

Shapers: 36" and 14". Slotters: 12" Betts, 54".

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New York City

All At Our Warehouse

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Partial List

Vertical Boring Mills

- | | |
|------------------------------------------------------|---------------------------------------------------------|
| 10 to 16' Niles, 2 heads, heavy duty fine condition. | 60" Niles-Bement-Pond, 2 swivel heads—heavy, latest. |
| 14' Standard, 2 swivel heads. | 48" Colburn, 2 swivel hds. modern. |
| 10' Hilles & Jones single head. | 42" Bullard, 2 swivel heads (1 with four sided turret.) |
| 100" Betts, fixed rail, 3 heads. | 36" Bullard, V.T.L. "Maximilltype." |
| 90" Pond, 2 swivel heads. | 30" Bullard, 1 swivel head. |
| 72" Betts, 2 swivel heads. | |

Radial Drills

- | | |
|-------------------------------------|------------------------------------------------------------------------------------------|
| 7' American Universal. | 10 spindle Bickford rail drill. |
| 6' Bickford semi-univ. gear box dr. | Baush, 5 spindle Multiple, cap. 1". |
| 54' Cincinnati, plain, motor drive. | Baush, 16 spindle Multiple, No. 2. |
| 54' Niles semi-universal. | 6 spindle Barnes upright double drill press, back geared, automatic knockout and return. |
| 5' Niles-Bement-Pond motor drive. | |
| 34' Gang, box table, etc. | |

Hammers

- | | |
|---------------------------------------|----------------------------|
| 250 to 500 lb. Sellers steam drop. | 60-lb. Bradley, helve. |
| 1500 lb. United Eng. board drop. | 80-lb. Yeakley, pneumatic. |
| Two (2) 800-lb. Merrill, board drops. | 25-lb. Bradley helve. |

Lathes

- | | |
|------------------------------------------------------|-------------------------------------|
| 50"x18' Fifield triple geared face plate drive. | 20"x10' Hamilton, d. b. g. |
| 36"x18' Putnam, hvy. duty taper att. | 20"x8' American, q. c., like new. |
| Two (2) 36"x14' Putnam, heavy duty, taper attachment | 18"x9' Bell semi-quick change, hvy. |
| 20"x18' Lodge & Shipley, geared hd. | 18"x8' L. W. Pond. |
| | 16"x6' Reed. |
| | 14"x6' Carroll, taper attachment. |

Planers

- | | |
|---------------------------------------------|---------------------------------------|
| 90"x90"x25' Farrell, 2 rail heads. | 36"x36"x18' Pease, 2 rail heads. |
| 60"x48"x20' Gleason, side and 2 rail heads. | 36"x36"x12' Cincinnati, 2 heads hvy. |
| 42"x42"x12' Pond, 2 rail heads. | 30"x30"x 6' Gray, 1 rail, 2 side hds. |

Presses

- | | |
|----------------------------------------------------------------------------------------|------------------------------------------------|
| Twent-Five (25) FARRELL, (10 double acting, 15 single), Nos. 1 to 6, strokes 2" to 9". | No. 512 Bliss, 33 tons working pressure. |
| No. 27-K Bliss, weight 70,000 lbs. | Adriance Inclined, 22"x30" platen, 14" stroke. |
| DA-4 Ferracute roll feed, double acting. | No. 1 Bliss str. side, grd., 14" stroke. |
| | Ferracute knuckle joint, 100 tons. |

MISCELLANEOUS.

- No. 28 Brown & Sharpe grinding mche., 18"x96", like new, weighs 19,600 lbs.
No. 2 Barrett Horizontal Boring Machine, 5" bar, heaviest pattern, 98% new.
Detrick & Harvey Vertical Boring Machine, 7" bar, 8"x94" table.
Two (2) 50"x8' Ingersoll Slab Millers.
37"x10' Niles Slab Miller.
No. 3 LeBlond High Duty, geared head Milling Machine.

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Boring mill, horizontal No. 0.
Compressor, 4½x5 Imperial type
No. 2, (2).
Die filer, No. S-1 Oliver, 60 cyc.
Drill, No. 2½ Avey h. s., 12"
overhang.
Drill, 26" Sibley, sliding head.
Drill, 10-spindle Grand Rapids
multiple.
Electric furnace, Haskins type
FB-208.
Grinder, No. 1 Willey electric
tool post.
Grinder, No. 1 W. & M., surface.

Grinder, 8x30 Modern.
Grinder, No. 2 Bath universal.
Hammers, 100 lb. Little Giant, (2).
Hammers, 250 lb. Little Giant, (2).
Millers, No. 7 Becker Lincoln, (2).
Miller, No. 34 Ohio heavy plain.
Millers, No. 1-B Fox plain, (2).
Planer, 36"x36"x8' New Haven.
Punch & shear, No. 54 Beloit.
Press, No. P-3 Ferracute.
Radial, 3' Grand Rapids sens.
Radial, 3' Economic.
Sand blast, Pangborn type AC-6.
Shaper, 16" Barker.

Complete list on application

McMullen Machinery Company

"Everything in Shop Equipment" Grand Rapids, Mich.

Second-Hand Machinery

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2 3" Hurlbut-Rogers, 4 ft. bed.

DRILLS.

3 Demco high speed ball bearing sensitive bench, NEW.
18" Baker Bros. stationary head, star lever and power feed.

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2 50 lb. Beaudry Champion power hammers, arranged for motor, NEW.

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14"x 4' Draper, with chuck.
16"x16' Bridgeport Automatic chucking lathe, cone drive.
17"x 8' Greaves-Klusman, compound rest, plain change gears.
28"x14' Ames, compound rest.
30"x10' Fifeild, compound rest.
32"x16' Fay & Scott, compound rest, turret on shears, fine condition.

SCREW MACHINES and TURRET LATHES.

1" Smith turret lathe.
2 1" Truman M. Smith screw machines, wire feed, plain head, cut-off.
3" Jones & Lamson flat turret lathe, with bar equipment.

MISCELLANEOUS.

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Grinder, surface grinder and countershaft.
Milling machine, No. 32 Kempnith plain, one arbor.
Pipe Machine, 3" Stoeber, with dies.

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8-72"x20' Tubular Boilers, Massachusetts specifications,
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60 cycle, 3 phase, like new.

150 H. P., G. E. Slip Ring Motor, 220 volt, 60 cycle,
3 phase.

200 Motors, all characteristics.

5½' Niles-Bement-Pond Radial Drill.

42" Barnes Back Geared Upright Drill.

24" Foote-Burt No. 25 Heavy Duty Drill.

21"x84" Landis Universal Cylindrical Grinder.

36"x28' Putnam Heavy Duty Lathe, late type, triple
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36"x18' Putnam Lathe, like the foregoing.

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32"x14' Fitchburg Engine Lathe.

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**Large Stock Boilers, Engines, Pumps, Generators,
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Any Idle Equipment?

If you have any Machine Tools you do not need, this is a good time to sell them

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21" x 10' LeBlond Heavy Duty, quick change, (10).
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28" x 14' Fifield, 4-step, loose change.
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4' Bickford, cone drive, (2).
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8-Spindle Western Multiple.
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32" Aurora, tapping attachment.
Style 2-M Baker, heavy duty.
42" Cincinnati Upright Drill.

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36" Flather, Spur.
No. 13 Brown & Sharpe, Spur and Bevel.
14" Eberhardt Bros., Spur and Bevel.

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30" Bullard Vertical, turret head.
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60" x 60" x 16' Niles Planer, two heads.
No. 20 Oesterlein Plain Miller.
No. 2 Brown & Sharpe Plain Miller.
No. 34 Ohio Plain Miller, heavy, 98% new.
No. 35 Ohio Universal Miller, 98% new.
No. 3 Kempsmith Plain Miller, 98% new.
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We have a large variety of other Machine Tools

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These machines are in A-1 condition.

Six $\frac{1}{4}$ Inch Automatic Screw Machines
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Each fitted with screw slotting attachment. Manufactured by Hartford Machine Screw Company. These machines adapted to the rapid production of all kinds of small screws, bushings, studs, etc. Condition, good as new.

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- 4' Fosdick Radial Drill.
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- No. 2 Washburn Shops two-spindle Drill.
- No. 4 Kempsmith Plain Maximiller.
- No. 28 Ohio Plain Milling Machine.
- 16" and 24" Ohio Shapers.
- 19x30 Webster & Perks Universal Grinder.
- No. 2 Grand Rapids Universal Grinder.
- 16"x7' Chard Lathes.
- 6x6 and 9x9 Peerless Hack Saws.
- No. 2 Toledo Hand Screw Machine.
- No. 0 Bickett Profiling Machines.
- No. 2 Garvin Screw Slotting Machines.
- No. 4 Canton Floor Crane.
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- Model C Becker Vertical Milling Machine.
- No. 6 Becker Vertical Milling Machine.
- No. 4B Becker Vertical Milling Machine.
- No. 14 Besly Disc Grinders.
- 20" Superior Drill Presses.
- 2x24 Jones & Lamson Turret Lathes.
- No. 2-26" and No. 2-36" Brown & Sharpe Gear Cutters.
- 6x6 Racine Hack Saw.
- 12"x6" Gould & Eberhardt Gear Hobbers.

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- 2—48"x38' Bridgeford Lathes, same as above.
- 1—48"x34' Bridgeford Lathe, same as above.
- 2—48"x54' Bridgeford Lathes, same as above.
- 1—72"x72"x10' Niles-Bement-Pond Planer, Heavy Duty, 4 heads.
- 1—No. 0 Giddings & Lewis Horizontal Boring Mill.
- 2—96" Niles Vertical Boring Mills, two swivel heads.
- 1—36" and 42" Bullard vertical Boring Mill, almost new.
- 1—No. 5 CINCINNATI Plain Miller, Single Pulley Drive.

-
- 1—Nos. 4-B and 5-B BROWN & S. Plain Millers, single Pulley.
 - 2—No. 4-B KEARNEY & TRECKER Plain Millers, complete.
 - 1—No. 3-B KEARNEY & TRECKER Plain Miller, complete.
 - 1—No. 3-B OWEN Plain Miller, with vertical attachment.
 - 2—No. 4 CINCINNATI Universal Millers, vertical head.
 - 2—NEW No. 3 KEMPSMITH Univ. Millers, with index centers.
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 - 1—No. 2 CINCINNATI Vertical Miller, sliding head.
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 - 1—28"x18' POND Lathe, with 12' between centers.
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 - 1—36"x36"x10' CINCINNATI Planer, two heads, complete.
 - 3—60"x60"x20' WOODWARD Planers, four heads, excellent.
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 - 3—18" and 12" DILL Slotters, complete with motor
 - 1—20" CINCINNATI Shaper, completé.
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 - 1—No. 59 1/4 TOLEDO Straight Sided Press, tie rod frame.
 - 1—No. 30-12 Spindle BAUSH Drill, complete.

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Air Guns

Powell Co., Wm., Cincinnati

Angle Plates

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Reid Brothers, Co., Inc., Beverly, Mass.
Whiting & Comstock, Hartford, Conn.

Arbors, Roller Grip

Alert Tool Co., Philadelphia

Arbors, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.
E. O. Partridge 2047 W. Lake St., Chicago

Automatics

McDonough Mfg. Co., Eau Claire, Wis.
National Acme Co., Cleveland
New Britain Machine Co., New Britain, Conn.

Balancing Ways

Anderson Bros. Mfg. Co., Rockford, Ill.

Ball Bearings

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., 253 W. 58th St., New York

Balls, Brass, Bronze and Steel

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., 253 W. 58th St., New York

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Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago

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Abbott Ball Co., Hartford, Conn.
Buchanan Co., Thom., Cincinnati
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Benchs, For Toolmakers

Ritchie-Werts Co., Dayton, Ohio

Bench Legs, Steel

New Britain Mch. Co., New Britain, Conn.

Bending Machines, Hand and Power

Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Bending Rolls, Plate and Angle

Wickes Bros., Saginaw, Mich.

Blue Printing Machines

Paragon Machine Co., Rochester, N. Y.
Wickes Brothers, Saginaw, Mich.

Bolt and Nut Machinery

Webster & Perks Tool Co., Springfield, Ohio

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Alert Tool Co., Philadelphia
Madison Mfg. Co., Muskegon, Mich.
Pedrick Tool & Machine Co., Philadelphia
Ready Tool Co., Bridgeport, Conn.
Ried Tool Holder Co., Washington, D. C.
Underwood Corp., H. B., Philadelphia

Boring Bars, Cylinder

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Boring, Drilling and Milling Machines, Horizontal

Heaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston
Fawcett & Harnischfeger Co., Milwaukee
Schipper Machine & Tool Co., Aurora, Ind.
Simmons Machine Co., Albany, N. Y.

Boring Heads

Waterston, J. M., Detroit, Mich.

Boring Machines, Cylinder

Barrett Mch. Tool Co., Meadville, Pa.

Boring Machines, Horizontal

Cincinnati Pulley Machinery Co., Cincinnati
Pedrick Tool & Machine Co., Philadelphia
Rockford Drilling Machine Co., Rockford, Ill.

Boring and Turning Machines, Vertical

Cincinnati Planer Co., Cincinnati
Simmons Machine Co., Albany, N. Y.
Turner Machine Co., Danbury, Conn.

Bowden Wire Mechanism

Gwilliam Co., 253 W. 58th St., New York

Brackets, Electric Light

Newman Mfg. Co., Cincinnati

Broaches

Lapointe Co., J. N., New London, Conn.

Broaching Machines

Lapointe Co., J. N., New London, Conn.
La Pointe Mfg. Co., V. E., Manchester, Conn.
Simmons Machine Co., Albany, N. Y.

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Bunting Brass & Bronze Co., Toledo, Ohio

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Bell & Gossett Co., 613 W. 30th St., Chicago
Buchanan Chemical Co., C. G., Cincinnati
Buchanan Co., Thom., Cincinnati

Cast Boring Machines

Craftsman Tool Co., Conneaut, Ohio

Casters for Trucks

Hamilton Caster & Mfg. Co., Hamilton, Ohio

Centers, Index

Abrasive Mch. Tool Co., E. Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Carter & Hakes Mch. Co., W. Winsted, Conn.
Dickow, Fred C., 1858 W. Lake St., Chicago
Schipper Machine & Tool Co., Aurora, Ind.
Stephens Co., John, Cincinnati
Whiting & Comstock, Hartford, Conn.

Chains, Power Transmission

Cullman Wheel Co., 1344 Altgeld St., Chicago
Morse Chain Co., Ithaca, N. Y.
Whitney Mfg. Co., Hartford, Conn.

Chasers

Modern Tool Co., Erie, Pa.
National Acme Co., Cleveland

Chucking Machines

New Britain Mch. Co., New Britain, Conn.
Wood Turret Machine Co., Brazil, Ind.

Chucks, Air

Frontier Chuck & Tool Co., Buffalo, N. Y.

Chucks, Centering

Cushman Chuck Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Thomas Elevator Co., 31 S. Hoyne Av., Chicago

Chucks, Draw-in and Throat

Hardinge Bros., 1770 Bertau Av., Chicago

Chucks, Drill

Cushman Chuck Co., Hartford, Conn.
Dalton Mfg. Corp., 1311 Park Ave., N. Y.
Hartford Special Mch. Co., Hartford, Conn.
Jacobs Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Nielsen-Barton Chuck Co., 106 S. Jefferson St., Chicago

Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Thomas Elevator Co., 31 S. Hoyne Av., Chicago
Weaver Mfg. Co., Springfield, Ill.

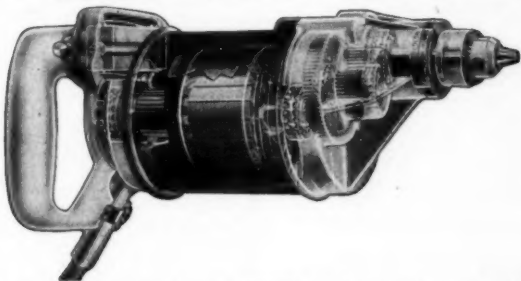
Chucks, Drill and Tap

Cushman Chuck Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Peter Bros. Mfg. Co., Algonquin, Ill.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Keyway Cutting

Scully-Jones & Co., Ry. Exch. Bldg., Chicago

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As against a last consideration, HISEY products are designed with Ball Bearing construction. Our new all Ball Bearing Electric Hand Drills of original design, shown above, are made in three sizes of following specifications:

Drilling capacities in steel in inches: 3-16", 1/4", 5-16". Capacities are correspondingly larger for softer materials. Net weight complete in pounds: 6, 8 and 11.

These small hand machines have been designed to meet the requirements of the trade where adaptable service is necessary. Workmanship, material and design is the result of twenty-two years of manufacturing experience in Electrical Tools, and they are HISEY-BUILT throughout, with Universal motor for operation on both Direct Current and Alternating Current of the same voltage.

These new HISEY All Ball-Bearing Hand Drills are time savers and money makers for employer and employes, as the handy and practical design appeals to the workmen—increased production is the result.

Our 16-page Catalog HML, describing these new machines, mailed on request. It will interest you.

We manufacture Electric Screw Drivers and a complete line of Ball-Bearing Grinding Machines

Agencies in all important cities.

The Hisey-Wolf Machine Co.
CINCINNATI, OHIO

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Cushman Chuck Co., Hartford, Conn.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Thomas Elevator Co., 31 S. Hoyne Ave., Chicago

Chucks, Magnetic

Hesold Machine Co., Worcester, Mass.

Chucks, Wrenchless

Thomas Elevator Co., 31 S. Hoyne Ave., Chicago

Clutches, Friction

Conway & Co., Cincinnati
Edgemont Machine Co., Dayton, Ohio
Milwaukee Shaper Co., Milwaukee, Wis.
National Clutch Co., 1859 Fulton St., Chicago

Cold Saws

Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Hly Co., Rochester, N. Y.
Greenfield Tap & Die Corp., Greenfield, Mass.
Peter Bros. Mfg. Co., Algonquin, Ill.

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Bonney Vise & Tool Works, Allentown, Pa.
Geuder, Paechke & Frey Co., Milwaukee, Wis.
New Britain Machine Co., New Britain, Conn.
Robbins, Gamwell & Co., Pittsfield, Mass.
Steber Machine Co., Utica, N. Y.

Couplings, Friction Clutch

Conway & Co., Cincinnati

Cranes, Hand Power

Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mch. Co., Canton, Ohio
Weaver Mfg. Co., Springfield, Ill.

Cranes, Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.

Crank Pin Turning Machine

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cranks, Ball

Cincinnati Ball Crank Co., Cincinnati

Cutters, Adjustable

Becker Milling Machine Co., Boston, Mass.
McCrosky Tool Corporation, Meadville, Pa.
Madison Mfg. Co., Muskegon, Mich.

Cutters, Bolt

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Cutters, Keyseating

Scally-Jones & Co., Ry. Exch. Bldg., Chicago
Whitney Mfg. Co., Hartford, Conn.

Cutters, Milling

American Mch. Products Co., Detroit, Mich.
Becker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., Meriden, Conn.
Genesee Mfg. Co., Rochester, N. Y.
Michigan Tool Co., Detroit, Mich.
Whitney Mfg. Co., Hartford, Conn.

Cutting-Off Machines

Davis Machine Tool Co., Rochester, N. Y.
Etna Mfg. Co., Toledo, Ohio
Peter Bros. Mfg. Co., Algonquin, Ill.
Wood Turret Machine Co., Brazil, Ind.

Cylinder Boring Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cylinder or Dome Facing Machines

Underwood Corp., H. B., Philadelphia

Die Heads, Self-Opening

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland

Diesing Machines

Henry & Wright Mfg. Co., Hartford, Conn.

Dies, Pipe Threading

Bignall & Keeler Mch. Wks., Edwardsville, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.

Dies, Screw and Thread Cutting

Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Bertraw Av., Chicago
National Acme Co., Cleveland

Dies, Self-Opening Adjustable

Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Murchey Mch. & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.
Victor Tool Co., Inc., Waynesboro, Pa.

Dogs, Machine

Ready Tool Co., Bridgeport, Conn.

Drilling Machine Heads

Harris Engr. Co., H. B., Bridgeport, Conn.
Nelson Banck Mfg. Co., Detroit, Mich.
Newman Mfg. Co., Cincinnati
Rockford Drilling Machine Co., Rockford, Ill.
Sellew Machine Tool Co., Pawtucket, R. I.
Spafford Tool Works, Hartford, Conn.
United States Machine Tool Co., Cincinnati

Drilling Machines, Bench

Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
High Speed Hammer Co., Rochester, N. Y.
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mch. Co., Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Hand

United States Machine Tool Co., Cincinnati

Drilling Machines, Horizontal

Fawling & Harnischfeger Co., Milwaukee, Wis.
Rockford Drilling Mch. Co., Rockford, Ill.

Drilling Machines, Multiple Spindle

Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland, Ohio
Edlund Machinery Co., Inc., Cortland, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Co., Cleveland
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mch. Co., Rockford, Ill.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Portable Electric

Hisey-Wolf Machine Co., Cincinnati
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago
Standard Electric Tool Co., Cincinnati
Stow Flexible Shaft Co., Philadelphia
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Drilling Machines, Post

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland, Ohio
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Silver Mfg. Co., Salem, Ohio

Drilling Machines, Radial

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland
Hawes, C. L., Ashabula, Ohio
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Pawling & Harnischfeger Co., Milwaukee, Wis.
Silver Mfg. Co., Salem, Ohio
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.
Wickes Bros., Saginaw, Mich.

Drilling Machines, Sensitive

Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
Edlund Machinery Co., Inc., Cortland, N. Y.

Classified Finding Index

Drilling Machines, Sensitive—Cont'd.

Fenn Mfg. Co., Hartford, Conn.
Hardinge Brothers, 1770 Berteau Av., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
United States Machine Tool Co., Cincinnati
Wisconsin Electric Co., Racine, Wis.

Drilling, Milling and Boring Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Drilling Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Candey-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Davis Machine Tool Co., Rochester, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
Hinkley Machine Works, Hinkley, Ill.
Hoosier Drilling Machine Co., Goshen, Ind.
Minster Machine Co., Minster, Ohio
Rockford Drilling Machine Co., Rockford, Ill.
Silver Mfg. Co., Salem, Ohio
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling and Tapping Attachments

Aurora Tool Works, Aurora, Ind.
Demco Machine Tool Co., Cleveland
Harris Eng. Co., H. E., Bridgeport, Conn.
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Newman Mfg. Co., Cincinnati
Reed Co., Francis, Worcester, Mass.
Schipper Machine & Tool Co., Aurora, Ind.
Sipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Pneumatic

Independent Pneumatic Tool Co., 699 W.
Jackson Blvd., Chicago

Drills, Twist

American Mch. Products Co., Detroit, Mich.

Dust Handling Equipment

Knickerbocker Co., Jackson, Mich.

Emery Stands

Blount Co., J. G., Everett, Mass.
Buchanan Co., Thos., Cincinnati
Marschke Mfg. Co., Indianapolis, Ind.
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters

Buchanan Co., Thos., Cincinnati
Cleveland Flus Cleaner Mfg. Co., Cleveland
Taylor & Fenn Co., Hartford, Conn.

Facing Heads, Automatic

Mummert-Dixon Co., Hanover, Pa.

Feeders, Oil and Soda Water

New Britain Machine Co., New Britain, Conn.

Filing Machines

Barry Mfg. Co., 515 W. Monroe St., Chicago
Cochrane-Bly Co., Rochester, N. Y.

Flexible Shafts

Stow Flexible Shaft Co., Philadelphia, Pa.

Forges

Candey-Otto Mfg. Co., Chicago Heights, Ill.

Furnaces

Bennett Co., W. R., Elmwood, Conn.

Furniture, Machine Shop

New Britain Machine Co., New Britain, Conn.

Gauges, Amplifying, Snap and Plug

American Gauge Co., Dayton, Ohio
North Side Tool Co., Dayton, Ohio

Gauges, Taper

Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gauging Machines

Davie Tool Co., Cleveland, Ohio
North Side Tool Co., Dayton, Ohio

Gear Cutting Machines

Brown & Sharpe Mfg. Co., Providence, R. I.

Gears

Boston Gear Works, Quincy, Mass.

Grinding Machines, Bench

Blount Co., J. G., Everett, Mass.
Partridge, E. O., 2047 W. Lake St., Chicago
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Cutter, Reamer and Tool

Blount Co., J. G., Everett, Mass.
Clough, E. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
Harris Eng. Co., H. E., Bridgeport, Conn.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Marschke Mfg. Co., Indianapolis, Ind.
Modern Tool Co., Erie, Pa.
Mummert-Dixon Co., Hanover, Pa.
National Acme Co., Cleveland
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Cylinder

Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Grinding Machines, Cylindrical

Brown & Sharpe Mfg. Co., Providence, R. I.
Greenfield Machine Co., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Schmidt Co., B. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Die

Abrasive Mch. Tool Co., E. Providence, R. I.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Modern Tool Co., Erie, Pa.
Reed Bros. Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Disc

Badger Tool Co., Beloit, Wis.
Selkew Machine Tool Co., Pawtucket, R. I.

Grinding Machines, Drill

Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
La Salle Tool Co., La Salle, Ill.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Face

Marschke Mfg. Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Gage

Abrasive Mch. Tool Co., E. Providence, R. I.

Grinding Machines, Internal

Dalton Mfg. Corp., 1911 Park Av., New York
Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Oilstone

Mummert-Dixon Co., Hanover, Pa.

Classified Finding Index

Grinding Machines, Portable

Hisey-Wolf Machine Co., Cincinnati
Independent Pneumatic Tool Co., 609 W.
Jackson Blvd., Chicago
Marshall Mfg. Co., Indianapolis, Ind.
Mummert-Dixon Co., Hanover, Pa.
Standard Electric Tool Co., Cincinnati
Stow Flexible Shaft Co., Philadelphia
Strand & Co., N. A., 625 W. Jackson Blvd.,
Chicago
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Grinding Machines, Snagging

Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
Hisey-Wolf Machine Co., Cincinnati
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Marshall Mfg. Co., Indianapolis, Ind.

Grinding Machines, Surface

Abrasive Mch. Tool Co., E. Providence, R. I.
Bristol Machine Tool Co., Bristol, Conn.
Heald Machine Co., Worcester, Mass.
Le Salle Tool Co., La Salle, Ill.
Reid Brothers Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perka Tool Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Hack Saw Machines

Armstrong-Bloom Mfg. Co., 341 N. Francisco
Ave., Chicago
Peerless Machine Co., Racine, Wis.

Hammers, Belt and Motor Driven

Barr H. Edall, Erie, Pa.
High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio

Hammers, Riveting

High Speed Hammer Co., Rochester, N. Y.

Handles, Machine

Cincinnati Ball Crank Co., Cincinnati

Heads, Dividing

Dickow, Fred C., 1858 W. Lake St., Chicago
Simmons Machine Co., Albany, N. Y.
Stephens Co., John, Cincinnati
Willard Press & Tool Co., Cincinnati

Hobbs

Michigan Tool Co., Detroit, Mich.

Hoists, Air

Independent Pneumatic Tool Co., 609 W.
Jackson Blvd., Chicago

Hoists, Electric

Euclid Crane & Hoist Co., Euclid, Ohio
Thomas Elevator Co., 31 S. Hoyne Ave.,
Chicago
Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Fawcett & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable

Canton Foundry & Machine Co., Canton, Ohio

Iron and Steel

Ryerson & Son, Jos. T., Chicago

Jigs, Fixtures, Tools, Etc.

American Mch. Products Co., Detroit, Mich.
Craftsman Tool Co., Cincinnati, Ohio
Hartford Special Mch. Co., Hartford, Conn.

Hinchley Machine Works, Hinchley, Ill.
Lee Co., Frank H., Danbury, Conn.
Nestor Mfg. Co., 40 W. 13th St., New York
North Side Tool Co., Dayton, Ohio
Spafford Works, Hartford, Conn.
Way Co., A. F., Hartford, Conn.
Whiting & Comstock, Hartford, Conn.

Joints, Universal

Atalio Mch. & Tool Works, Hartford, Conn.

Keyseating Machines

Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
Lapointe Co., J. N., New London, Conn.
National Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Knurled Holder

Austin Tool & Machine Co., Inc., Pittsburgh

Lathe Accessories and Attachments

Dalton Mfg. Corp., 1511 Park Av., New York
Greaves-Klusman Tool Co., Cincinnati
McCroskey Tool Corporation, Mendville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.
South Bend Lathe Works, South Bend, Ind.

Lathe, Bench

Blount Co., J. G., Everett, Mass.
Dalton Mfg. Corp., 1511 Park Av., New York
Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berceau Av., Chicago
South Bend Lathe Works, South Bend, Ind.

Lathe, Engine

Bore & Engine Machine Tool Co., Cincinnati
Candy-Otto Mfg. Co., Chicago Heights, Ill.
Carroll-Jameson Mch. Tool Co., Batavia, Ohio
Chard Lathe Co., Newcastle, Ind.
Dalton Mfg. Corp., 1511 Park Av., New York
Davis Machine Tool Co., Rochester, N. Y.
Greaves-Klusman Tool Co., Cincinnati
Lehmann Machine Co., St. Louis, Mo.
Monarch Machine Tool Co., Sidney, Ohio
Mueller Machine Tool Co., Cincinnati
Ryerson & Son, Jos. T., Chicago
Sidney Tool Co., Sidney, Ohio
South Bend Lathe Works, South Bend, Ind.
Willard Machine Tool Co., Cincinnati
Worcester Lathe Co., Worcester, Mass.
Wickes Bros., Saginaw, Mich.

Lathe, Flat Turret

Acme Machine Tool Co., Cincinnati

Lathe, Foot Power

Dalton Mfg. Corp., 1511 Park Av., New York

Lathe, Horizontal Turret

Acme Machine Tool Co., Cincinnati
Chard Lathe Co., Newcastle, Ind.
Davis Machine Tool Co., Rochester, N. Y.
Smurr & Kamen Co., 328 N. Albany Av.,
Chicago
Steinle Turret Machine Co., Madison, Wis.
Wood Turret Machine Co., Brazil, Ind.

Lathe, Short Cut

Adams Mfg. Co., O. R., Rochester, N. Y.
Sidney Tool Co., Sidney, Ohio

Lathe, Speed and Hand

Blount Co., J. G., Everett, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.

Lathe, Tilted Turret

Wood Turret Machine Co., Brazil, Ind.

Lockers, Shelving and Cupboards, Steel

Terrell's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding

Alert Tool Co., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Mandrels, Solid

American Mch. Products Co., Detroit, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Classified Finding Index

Metal Cutting Machines, Sheet

Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Milling Attachments

Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Connecticut, Ohio
Hinckley Machine Works, Hinckley, Ill.
Knight Machinery Co., W. B., St. Louis, Mo.
Stephoe Co., John, Cincinnati
Whiting & Comstock, Hartford, Conn.
Willard Press & Tool Co., Cincinnati

Milling Machines, Automatic

Becker Milling Machine Co., Boston, Mass.

Milling Machines, Bench

Burke Machine Tool Co., Connecticut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Brothers, 1770 Bertraw Ave., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Bristol Machine Tool Co., Bristol, Conn.
Burke Machine Tool Co., Connecticut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Davenport Mfg. Co., Meadville, Pa.
Stephoe Co., John, Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Gooley & Edlund, Cortland, N. Y.
Stephoe Co., John, Cincinnati

Milling Machines, Plain

American Milling Machine Co., Cincinnati
Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Connecticut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Davenport Mfg. Co., Meadville, Pa.
Gooley & Edlund, Cortland, N. Y.
Stephoe Co., John, Cincinnati

Milling Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

American Milling Machine Co., Cincinnati
Becker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cochrane-Bly Co., Rochester, N. Y.
Stephoe Co., John, Cincinnati

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Bristol Machine Tool Co., Bristol, Conn.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Connecticut, Ohio
Clough, R. M., Meriden, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Knight Machinery Co., W. B., St. Louis, Mo.
Taylor & Fenn Co., Hartford, Conn.

Mills, Adjustable Hollow

Genesee Mfg. Co., Rochester, N. Y.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Nut Facing Machines

Victor Tool Co., Inc., Weymouth, Pa.

Oil Cups

American Galco, Inc., 8 W. 40th St., New York
Gite Bros. Mfg. Co., 1940 S. Kilbourne Av.,
Chicago

Tucker, W. C. & F. C., Hartford, Conn.

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Oils, Quenching

Bell & Gossett Co., 613 W. 30th St., Chicago

Parallels, Adjustable

Herith Mfg. Co., O. E., Hartford, Conn.

Pattern Shop Machinery

Chicago Mch. Exchange, 1219 Washington
Riv., Chicago
Cochrane-Bly Co., Rochester, N. Y.
Silver Mfg. Co., Salem, Ohio
Towsley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Bignall & Keeler Mch. Wks., Edwardsville, Ill.
Simmons Machine Co., Albany, N. Y.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Planing Machines, Metal

Cincinnati Planer Co., Cincinnati
Lee Co., Frank H., Danbury, Conn.

Pneumatic Tools

Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago

Polishing and Buffing Machines

Blount Co., J. G., Everett, Mass.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
New Britain Machine Co., New Britain, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago
Stow Flexible Shaft Co., Philadelphia
Webster & Perks Tool Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids,
Wisconsin Electric Co., Racine, Wis.

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Lourie Mfg. Co., Springfield, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Weaver Mfg. Co., Springfield, Ill.

Presses, Broaching

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Lourie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Rockford Iron Works, Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Loshbough-Jordan T. & M. Co., Elkhart, Ind.
Rockford Iron Works, Rockford, Ill.
Willard Press & Tool Co., Cincinnati

Presses, Punch

Enterprise Machinery Co., 32 S. Clinton St.,
Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Loshbough-Jordan T. & M. Co., Elkhart, Ind.
Lourie Mfg. Co., Springfield, Ill.
Partridge E. O., 2047 W. Lake St., Chicago
Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
Lourie Mfg. Co., Springfield, Ill.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Towsley Mfg. Co., John T., Cincinnati
Weaver Mfg. Co., Springfield, Ill.

Classified Finding Index

Pulley Machinery

Cincinnati Pulley Mch. Co., Cincinnati

Pulleys, Iron, Solid and Split

Conway & Co., Cincinnati

National Clutch Co., 1859 Fulton St., Chicago

Pryett Fdry. Co., 328 N. Sangamon St. Chicago

Pumps, Centrifugal

Len-Courtenay Company, Newark, N. J.

Pumps, Fire

Lee-Courtenay Company, Newark, N. J.

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco

Av., Chicago

Hendley & Whittemore Co., Beloit, Wis.

Punches, Power

Clough, R. M., Meriden, Conn.

Hendley & Whittemore Co., Beloit, Wis.

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Ryerson & Son, Jos. T., Chicago

Wicks Bros., Saginaw, Mich.

Punches and Dies

Hendley & Whittemore Co., Beloit, Wis.

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Lewthwaite Mch. Co., T. H., 415 E. 31st St.,

North Side Tool Co., Dayton, Ohio [New York

Rockford Iron Works, Rockford, Ill.]

Racks, Bar Stock

Yobe Supply Co., Wm. S., Canton, Ohio

Reamer Holder, Floating

Victor Tool Co., Inc., Waynesboro, Pa.

Reamers, Solid

American Mch. Products Co., Detroit, Mich.

Clough, R. M., Meriden, Conn.

McCroaky Tool Corporation, Meadville, Pa.

Ready Tool Co., Bridgeport, Conn.

Reamers, Adjustable

Cushman Tool Co., Waynesboro, Pa.

Clough, R. M., Meriden, Conn.

Greenfield Tap & Die Corp., Greenfield, Mass.

McCroaky Tool Corporation, Meadville, Pa.

Reamers, Cylinder

Hinckley Machine Works, Hinckley, Ill.

McCroaky Tool Corporation, Meadville, Pa.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.

High Speed Hammer Co., Rochester, N. Y.

Independent Pneumatic Tool Co., 800 W.

Jackson Blvd., Chicago

Rod Cutters

Armstrong-Blum Mfg. Co., 341 N. Francisco

Av., Chicago

Hendley & Whittemore Co., Beloit, Wis.

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Tucker, W. C. & F. C., Hartford, Conn.

Roller Bearings

Gwilliam Co., 253 W. 68th St., New York

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co., Rockford, Ill.

Screw Driving Machines, Automatic

Reynolds Machine Co., Massillon, Ohio

Screw Machines, Automatic

Brown & Sharpe Mfg. Co., Providence, R. I.

Cincinnati Automatic Mch. Co., Cincinnati

National Acme Company, Cleveland

New Britain Mch. Co., New Britain, Conn.

Screw Machines, Plain or Hand

Acme Machine Tool Co., Cincinnati

Smurr & Kamen Co., 328 N. Albany Av.,

Chicago

Wood Turret Machine Co., Brazil, Ind.

Screws, Cap and Set

National Acme Company, Cleveland

Second-Hand Machinery Dealers

Adams, Ogden R., Rochester, N. Y.

Aetna Machinery Corp., Newark, N. J.

Allen Mch. Co., B. C., 104 S. Clinton St.,

Chicago

Badger-Packard Mch. Co., Milwaukee, Wis.

Bath & Co., Cyril J., Cleveland, Ohio

Bennett Machinery Co., G. L., 39 Church

St., New York

Biggs-Watterson Co., Cleveland

Broadway Machinery Co., Cincinnati

Brown-McDonald Mch. Co., St. Louis, Mo.

Brownell Machinery Co., Providence, R. I.

Clinton Machinery Exchange, 113 S. Clinton

St., Chicago

Co-Operative Machinery Co., Cleveland

Dale-Brewster Machinery Co., 341 Washington

Bldg. Chicago

Dickow, Fred C., 1858 W. Lake St., Chicago

Easley Machinery Co., E. L., 555 Washington

Bldg., Chicago

Federal Mch. Sales Co., 12 N. Jefferson St.,

Chicago

Fitzgerald & Co., W. H. J., Boston, Mass.

Girard Machine & Tool Co., Philadelphia

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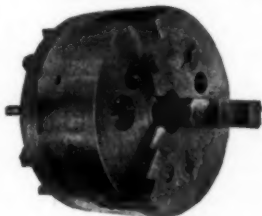
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**Built in a Single Unit
Simpler—Cheaper to Install
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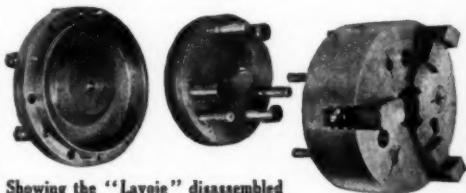
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because of its great simplicity and ease of application to the work. The complete chucking and operating mechanism are all included in a single unit, and it can be installed directly on the end of the spindle or removed as readily as any ordinary chuck. The clamping mechanism is of the lever and wedge type—absolutely no gears.



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Let us tell you how it's made and what it does

Frontier Chuck & Tool Co.
36 Letchworth St., Buffalo, N. Y.

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A remarkably Light, Strong and Convenient Drawer for those whose requirements do not demand the wooden back, bottom and front of our Frictionless Type Bench Drawer



A hem of triple thickness around the upper edge and the welding of all joints provide great strength and durability. The slide ways are integral with the top and insure a smooth, free movement, without tendency to bind.

A solid sheet metal top makes impossible any pilfering from the rear. It also prevents blocking or a lock-out through wedging of contents, and keeps out any water or oil that might occasionally soak thru from above.

Furnished as a unit; requires no fitting or cutting of bench. Shipping weight, 40 pounds.

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The New Britain Machine Company

**"Shop Furniture
Originators"**



**New Britain,
Conn. U.S.A.**

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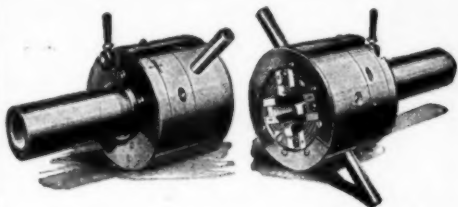
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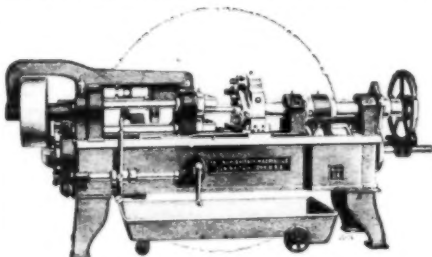
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